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PSYCHOLOGY IN EVERYDAY LIVING

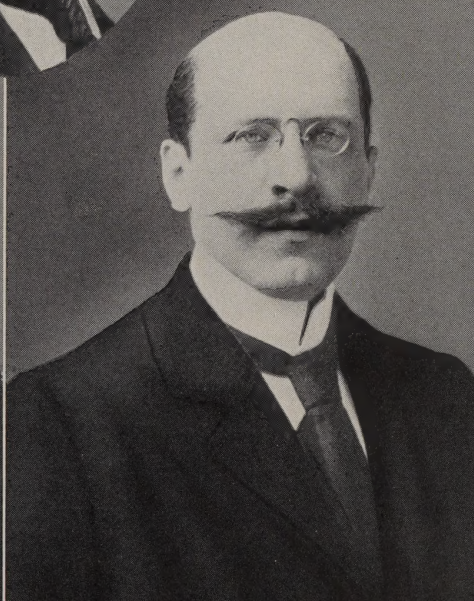
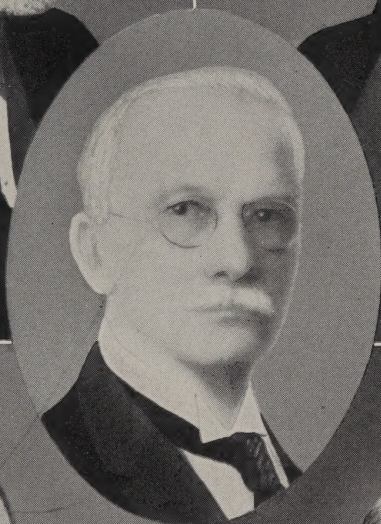
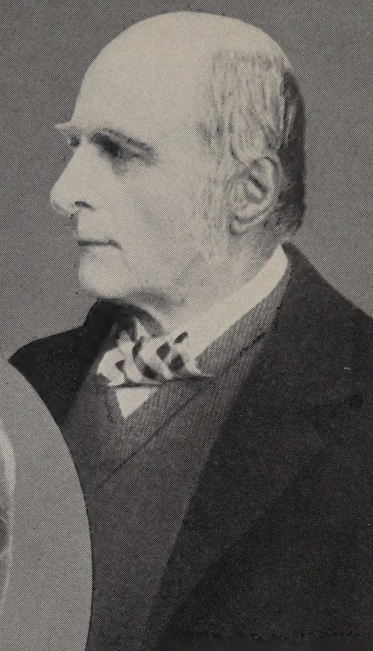
PIONEERS OF PSYCHOLOGY

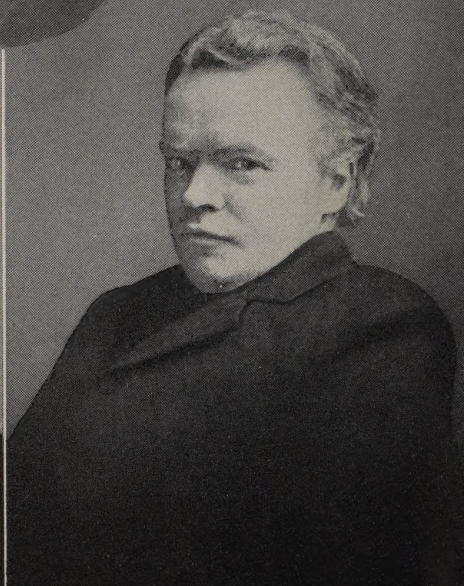
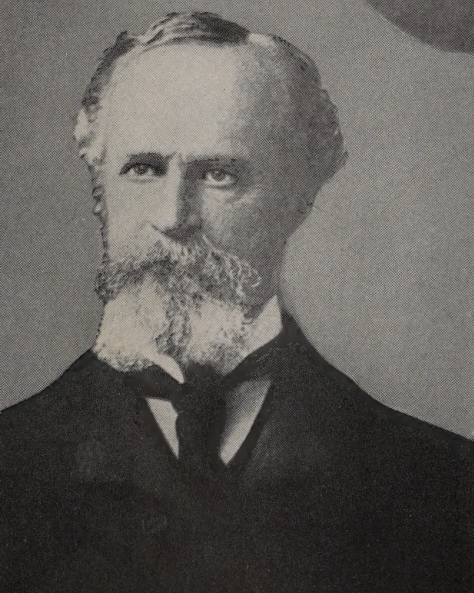
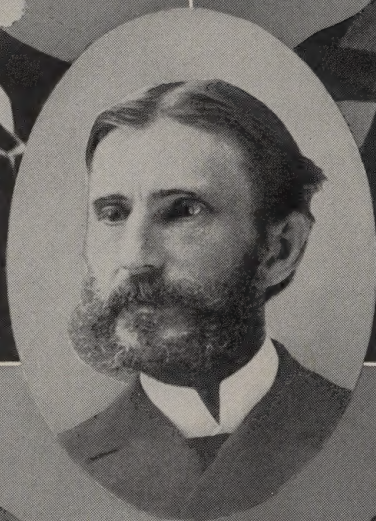
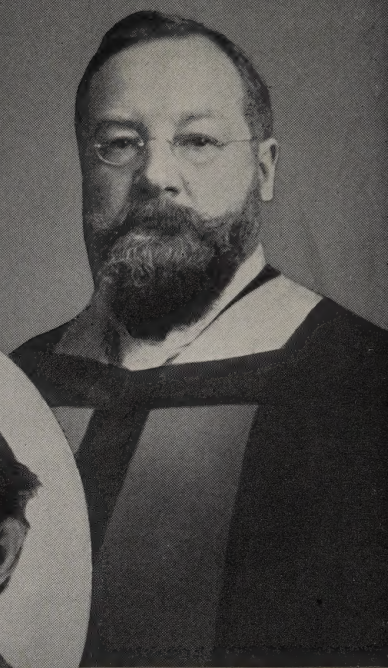
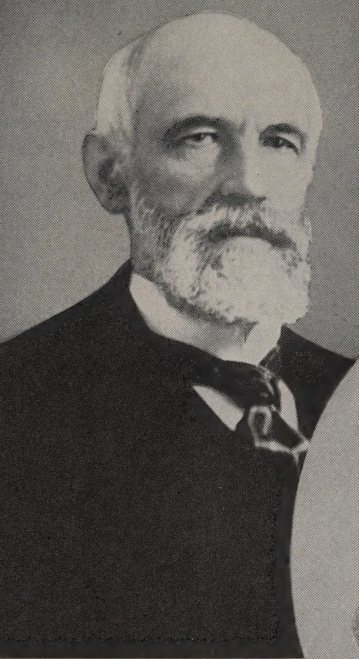
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Upper left, Wilhelm Wundt (1832-1920), Leipzig. *Upper right*, Francis Galton (1822-1911), Cambridge. *Center*, James Mark Baldwin (1861-1934), Princeton and Johns Hopkins. *Lower left*, Alfred Binet (1857-1911), Paris. *Lower right*, Hugo Münsterberg (1863-1916), Harvard. Photograph of Baldwin by courtesy of Mrs. Baldwin; photograph of Binet by courtesy of Open Court Publishing Company and C. H. Stoelting Company; all others by courtesy of The Science Press.

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Upper left, G. Stanley Hall (1846-1924), Clark. *Upper right*, Edward B. Titchener (1867-1927), Cornell. *Center*, George Trumbull Ladd (1842-1921), Yale. *Lower left*, William James (1842-1910), Harvard. *Lower right*, Josiah Royce (1855-1916), Harvard. Photographs of Hall and James by courtesy of Keystone View Company; all others by courtesy of The Science Press.





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PSYCHOLOGY

in Everyday Living

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PREFACE

Psychology in Everyday Living has been written to meet the need of the college student for a well-integrated, modern text which will materially contribute to his ability to manage his own life, and to the realization of certain other fundamental purposes of a general liberal education.

The purpose of the authors was to introduce important data, principles of psychology, and points of view to students who, for the most part, will never become professional psychologists. Hence the volume is not just another traditional textbook; instead the principles have been presented through the problems of the student's own personality and social adjustments. The authors aim not only to present the facts of empirical psychology, but also to show their implications where possible, and particularly their application to the life and activity of college students. Such concepts as managing one's own life, personality development, planning a career, socialization, learning, and other practical applications have been stressed.

The volume contains a minimum number of references and footnotes, since copious references, though they give a scholarly appearance, are apt to be confusing to beginning students. The aim has been to make the treatise psychologically sound without undue emphasis on technical terms and without including the names of a large number of contributors to the subject. Psychologists will, of course, recognize references to experimental work and points of view which are not documented in the text.

References are given at the close of each chapter for the convenience of both instructor and student. Special attention is called to some recent volumes of source material: *Readings in Psychology* and *Readings in Educational Psychology*, both published by Farrar and Rinehart and edited by Charles E. Skinner and Associates; *Readings in Industrial Psychology*, edited by B. V. Moore and G. W. Hartmann and published by D. Appleton-Century Company; *Sourcebook for Social Psychology*, edited by Kimball Young

and published by F. S. Crofts; and Henry E. Garrett's *Great Experiments in Psychology*, published by D. Appleton-Century Company. An additional book list appears at the close of the volume. Each of these special volumes provides excellent supplementary reading materials for the beginner in psychology.

The book is a coöperative venture, having been written by a group of psychologists. Each holds a professorship in a large university, and each has taught courses in general psychology to college students. All were guided by the general pattern devised to give unity to the whole manuscript and prevent overlapping and duplication.

The division of labor in the preparation of the manuscript was as follows: The general planning of the volume, the point of view, and the topics to be included were the result of discussions by the several participants. Professor Powers was responsible for the writing of Chapters I-IV, VII, X; Professor McConnell for Chapters V-VI, VIII-IX, XI-XII; Professor Trow for Chapters XIII-XVII; Professor Moore for Chapters XVIII-XIX; and Professor Skinner for Chapters XX-XXI.

Thanks are due to Dean Willis L. Uhl and Dr. C. F. Davidson for reading the manuscript and making suggestions on Part I. Grateful acknowledgment is also made to Edward Spencer Cowles, M.D., G. G. Deaver, M.D., and Charles W. Robertson, Ph.D., for suggestions concerning Chapter XX.

The following members of the University of Minnesota staff read the chapters indicated: Professor H. C. Langstaff, Chapters VIII and IX; Professor C. P. Archer, Chapters VI, VIII, and IX; and Professor Marcia Edwards, Chapter XI. These persons, of course, are not responsible for errors in fact or interpretation.

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June 1, 1938

THE AUTHORS

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I. THE NATURE OF PSYCHOLOGY

CHAPTER I

PSYCHOLOGY IN EVERYDAY LIVING

THE PRACTICAL VALUE OF PSYCHOLOGY

Psychology is a subject of the greatest practical value in the world today. At no time in history has it been more true that the proper study of mankind is man, for we must know more about ourselves than we do now, if our culture is to continue. The physical sciences have taken gigantic strides forward within recent years, making possible an array of mechanical and structural contrivances which, unfortunately perhaps, have created as many problems as they have solved. Man must adapt himself, not only to nature, but to the new and complicated social environment created by his inventions; and the process of doing so is not an easy one. Psychology is the systematic study of man himself in the process of making these adaptations.

There are those who say that psychology needs no special scientific study; that it is entirely a problem in close observation which anyone can make without any special training. A wealth of evidence, both of an experimental and of a common-sense sort, refutes this point of view. So simple a matter as reaction time, for example, cannot be conjectured, but must be made the object of systematic experimentation.

It may be admitted that formerly the products of the psychological laboratories were often of little or no practical value. Practical problems were not seriously investigated, and applications of psychological findings were not many, nor were they very useful. Hence it was easy to conclude that all the knowledge man needed of himself or others could be obtained without special training, simply from experience and shrewd observation. But, as the recent work with tests of many sorts, the investigations in medical and

social fields, and the clinical information that has been compiled indicate, in the areas which are now being scientifically explored, results of great practical value are being obtained, and the techniques used have proved more reliable than any observations an individual can make of himself and his fellows.

DEVELOPMENT OF PSYCHOLOGY

Although psychological experimentation is relatively young, psychological thinking has a long past. The ramifications of this past cannot be traced in detail here, but a few highlights in the development of psychological thought, and some of the directions in which it has led, may be indicated.

The writings of Aristotle mark the first systematic effort toward psychological thinking. From the intuitive and observational point of view, later generations have not improved greatly on Aristotle. He recognized the sensory basis of learning and made a creditable effort to delineate conduct levels, a problem which is still puzzling psychologists.

For many centuries after Aristotle's time, the main contributions to psychology were the rediscoveries which were made of his work. However, one discerns a faint foreshadowing of certain phases of modern physiological psychology in the Greek physician Galen, whose delineation of the temperaments is still in use. Developments in physiology in the seventeenth century led to the study of the nervous system, and more particularly of the sense organs, and ultimately, in the nineteenth century, to the physiological psychology of Wundt and his followers. But the greatest biological impact came from Darwin and Spencer.

The early statements of evolutionary theory provided the opportunity to bridge the dualism of mind and body which Descartes in the seventeenth century had insisted on. *Adaptation*, *adjustment*, and *function* became psychological words as well as biological, and

FAMOUS LIVING AMERICAN PSYCHOLOGISTS. *Upper left*, James Rowland Angell (Bachrach photograph). *Upper right*, J. McKeen Cattell (Keystone photograph). *Center*, Walter B. Pillsbury. *Lower left*, Walter Van Dyke Bingham (Bachrach photograph). *Lower right*, Robert S. Woodworth (Bachrach photograph).





the way was open for later educational developments and clinical practice.

Herbart's notion, that ideas are never lost permanently, directed psychology in the early nineteenth century to practical learning issues. He insisted on an active form of association of ideas, and suggested definite techniques of instruction derived from his theory of mind. Ebbinghaus did some of the earliest work on learning levels, a topic drawing no little attention at the present time. His experiments on nonsense-syllable learning have been repeated many times, and their technique is frequently employed.

At the present time there are certain fairly well marked national tendencies among psychologists. The German Gestalt school, as represented by Wertheimer, Koffka, and Köhler, has emphasized the importance of the total situation in the interpretation of the responses of an individual. The French school has turned definitely toward the investigation of mental deviation and abnormality, and the names of Charcot, Ribot, and Janet are well known to any student of psychiatry. Freud, an Austrian, and Jung, a Swiss, have given the psychoanalytical turn to the psychology of the abnormal. English psychologists were for a long time concerned primarily with the development of a psychology based on the association of ideas. The greatest genius among them was Sir Francis Galton (1822-1911). Galton was interested in many phases of psychology, and made pioneer studies of the kinds of imagery and the inheritance of capacity. His *Hereditary Genius* presents some of his findings. Galton's influence is still felt in the statistical studies of intelligence of Spearman and in the genealogical studies of the American psychologist, Cattell.¹

William James of Harvard (1842-1910) has been called the "father of American psychology." Beginning as a physiologist,

¹ Of the later English psychologists, the works of Ward, Stout, McDougall, Drever, Spearman, Myers, Ogden, and Rivers are among the best known.

FAMOUS LIVING AMERICAN PSYCHOLOGISTS. *Upper left*, Charles H. Judd. *Upper right*, Edward Lee Thorndike (Ossip Garber photograph). *Center*, John Dewey (Keystone photograph). *Lower left*, Lewis M. Terman. *Lower right*, J. E. Wallace Wallin.

James's scholarship led him through the field of psychology to philosophy and ethics. While his experimental work was meager, he set up a laboratory even earlier than Wundt, and his two-volume treatise on psychology is still recognized as the greatest work of its kind that America has produced. Some of James's experiments are open to criticism in terms of modern experimental criteria, but he contributed richly to the progress of psychology. His illuminating discussions of habit, emotion, the stream of consciousness, and the varieties of religious experience are perhaps the most important of his contributions. G. Stanley Hall, who founded the *American Journal of Psychology* and the American Psychological Association, concerned himself, like James, with a wide range of interests. He did perhaps more than any other one person to accelerate interest in and study of the problems of childhood and adolescence.¹

No discussion of American psychology would be complete without mention of E. L. Thorndike, whose pioneering in many fields has opened the way for a host of followers. His innovations and theoretical formulations have been primarily concerned with learning in one or another of its many phases. Some of his innovating contributions are the following: laboratory animal experimentation, the systematic use of statistical method, ability scales, achievement tests, word-frequency studies eventuating in a children's dictionary, and new experimental methods for the investigation of adult learning and of wants and interests.²

¹ J. Mark Baldwin, J. R. Angell, George Trumbull Ladd, Hugo Münsterberg, John Dewey, J. McKeen Cattell, Josiah Royce, and E. B. Titchener are other names prominent at the turn of the century in American psychology.

² The foregoing résumé is purposely both general and brief. Students who are interested in the history of the science can begin with the names given and expand their reading indefinitely. The complete documentation of this section would run to many pages and would be appropriate only in a more advanced text. Cf. E. G. Boring, *A History of Experimental Psychology*, Century, 1929; Gardner Murphy, *Historical Introduction to Modern Psychology*, Harcourt, Brace, 1929; and C. E. Skinner and Associates (Editors), *Readings in Psychology*, chap. XXV, "History of Psychology," by W. B. Pillsbury, Farrar and Rinehart, 1935.

FIELDS FOR THE APPLICATION OF PSYCHOLOGY IN MODERN LIFE

(1) *Psychology in business.* There have been in the past, and there still are, business men who think that psychology is a vague, impractical study concerned with such topics as mesmerism, hypnotism, and insanity, and that it is of no value in the world of industry. These misinformed individuals are generally committed to the naïve theory previously mentioned, that anyone can become a master of human conduct by simply giving it a little thought. It is a significant fact, however, that there is practically no major industry at the present time which does not have on its payroll a psychologist, public relations counsel, director of consumer research, or some similar officer. The titles differ, but the thing which the person who holds the job does is almost always the same; namely, to investigate "consumer psychology." This is wise and economically profitable. The history of advertising, for example, contains numerous painful illustrations of how a miscalculation of public temper on some controversial subject has resulted in a considerable financial loss.

Although we are not concerned with business ethics primarily in this treatise, it should be noted at this point that some of the applications of psychology in the field of business are efficient but unethical. Correction of this situation is a social and not a psychological problem. The psychologist supplies a practical description of the mechanism of influencing other people; he cannot, however, be held responsible for the practices of unethical individuals who use his contributions to further purposes that are socially questionable. For example, there are certain words such as *wholesome*, *goodness*, *sweetness*, *clean*, and the like, which have a highly favorable connotation in the minds of nine out of ten people. Use of these words in describing products inclines the person in the direction of buying. Frequently, however, the description is entirely inaccurate, as has been pointed out by competent investigators.¹ There is a fairly large number of books on the market at the present time calculated to render the public more sophisticated in matters of merchandising. Furthermore, the modern school curriculum contains courses in

¹ Stuart Chase and F. J. Schlink, *Your Money's Worth*. Macmillan, 1932.

home economics and social orientation which incline to the same end.

A quotation from Hepner illustrates the use of psychology in the modern business world: ¹

The business man spends a major portion of his time in analyzing and influencing the behavior of other persons; but he also has himself as a constant subject of analysis and control. His own psychological problems may be as difficult to analyze and to solve as those of other persons. In order that we might know what some of the psychological problems of business men are, an attempt was made to discover the most prominent questions that interest or baffle them. Approximately five hundred business men were interviewed, and asked to list the problems of a psychological nature which were most acute with them. As a result of this survey a list of 97 problems was tabulated. Later on, this list was submitted to several hundred business men and the replies for 167 men were selected at random and tabulated for the percentages of business men who had each problem in the list. These 167 business men who listed their problems stated that their past or present business experiences involved functions enumerated in the following table:

<i>Business Functions</i>	<i>Per Cent Performing Those Functions</i>
Executive (major and minor)	66.6
Salesmanship	39.6
Supervisory	37.8
Department head	30.6
Retailing	22.2
Accounting	17.5
Sales management	15.0
Production	12.0
Business counseling	9.6
Buying	1.2

The men who reported their experience were not limited to any one function or phase of business. Thus, a man was permitted to report himself as an executive, a department head, and in the field of production.

The following table gives the number of years that they had been working in the business world since they left school or college.

¹ Reprinted by permission from *Psychology in Modern Business*, by H. W. Hepner. Copyright 1930, Prentice-Hall, Inc., New York City. Pp. 9-13.

<i>Number of Years</i>	<i>Number of Men</i>	<i>Total Per Cent</i>
16 and above	99	59.4
11-15	30	18.0
6-10	20	12.0
1-5	9	5.3
Not stated	9	5.3
	<hr/>	<hr/>
	167	100.0

The psychological problems and the per cent of business men who reported each problem were as follows:

<i>Psychological Problems of Business Men</i>	<i>Per Cent Having Problem</i>
1. Remembering names and faces of people	75.0
2. How to make employees enthusiastic and energetic	72.6
3. How to obtain the maximum amount of work from employees	68.4
4. Ability to forget business and enjoy yourself after working hours	66.6
5. How to get employees to coöperate with others	62.4
6. How and when to praise an employee	60.0
7. Selecting suitable men for promotion	58.8
8. When hiring, what questions should be asked	58.8
9. How to turn down a salesman in such a way that he will respect your decision and call again, or not, as you wish	58.2
10. Satisfying disgruntled customers so as to keep their trade	58.2
11. How and when to reprimand an employee	58.2
12. Praising the men or explaining their faults to obtain better work	56.4
13. How one should act toward competitors	55.8
14. Refusing an employee a raise in pay and at the same time keeping him working, unprejudiced, and ambitious	55.2
15. How to get the most out of your time while at work	55.2
16. Extension of credit to customers	54.6
17. Advance of pay to employees	54.0
18. How to be stern and commanding and yet keep employee's good will	54.0

<i>Psychological Problems of Business Men</i>	<i>Per Cent Having Problem</i>
19. How to make a good impression when entering a business office	54.0
20. How to make men satisfied with their work	53.4
21. How intimate should executives become with employees . . .	53.4
22. How kindly to refuse a man a job	53.4
23. Assigning jobs according to ability and character of the man	52.2
24. How to deal with cliques and petty jealousies among employees	52.2
25. How to deal with the employee who constantly complains . .	52.2
26. How to make a good impression when leaving a business office	51.0
27. How to increase sales during slack seasons	50.4
28. How to handle applicants for positions	50.4
29. The extent to which employees should be taken into confidence	50.4
30. How to check up on employees	50.4
31. How to deal with tardiness	49.8
32. How to deal with the employee who "knows it all"	48.6
33. How the executive can induce his employees to look ahead . .	48.0
34. How to create harmony between employer and employees . .	48.0
35. How far employees should be trusted	47.4
36. How to get rid of salesmen who "hang on"	47.4
37. How to introduce new methods and systems to employees . .	44.4
38. How to eliminate useless movements of workers	44.4
39. How to make employees feel at ease with you	44.4
40. How to deal with absences	44.4
41. How to deal with the employee who thinks he is indispensable	44.4
42. How to make a job attractive to an employee	43.8
43. Selecting congenial business companions	43.2
44. When to reward an employee for extra service	42.0
45. How to treat the employee who lies	42.0
46. How to reward efforts of employees to improve the business .	41.4
47. How to get better acquainted with employees	40.2
48. Intoxication	40.2
49. How to create selling points for a product	39.6
50. How to deal with solicitors for churches, charities, etc. . . .	39.6
51. Methods of displaying goods	39.0

*Psychological Problems of
Business Men*

*Per Cent
Having
Problem*

52. How to convince people that merchandise of higher quality is necessarily higher in price	39.0
53. Whether employees should be taught all about the business . .	39.0
54. Coöperation between sales, credit, and collection departments	37.8
55. How to extend financial aid to employees	37.8
56. How to deal with the customer who seeks a low bid	37.8
57. How to put the personal element into dealings with customers and clients	37.2
58. Vacations—good work before and after	37.2
59. How to curb dissension when one or two employees start dissatisfying talk	36.0
60. How a contract may be obtained when competition is keen . .	36.0
61. How to approach one's superior and how to secure a favor . .	35.4
62. How to be able to have faith in the business during a depression	35.4
63. How to convince the worker that his wages are based on his productivity	35.4
64. How to have employees remember who their supervisor is . .	34.8
65. Cashing checks for persons not well known	34.2
66. How to ask for a raise or a promotion	34.2
67. Doing little things for your customers that will appeal to their emotions	31.8
68. Developing a philosophy of business	31.2
69. Putting a product on the market at the proper time to meet seasonal trade	30.6
70. How to keep relatives from expecting too much	30.6
71. When to name the price of an article	30.0
72. How to deal with men who are always telling on the other fellow to put themselves in right	30.0
73. Acquiring a knowledge of trade journals	30.0
74. Acquiring a knowledge of office appliances	29.4
75. Sharing profits with the employees	29.4
76. "Selling" salesmen on a new line	28.8
77. How to be popular in the social world as well as in business . .	28.8
78. Substituting another product for the product asked for . .	28.2
79. How to create an interest in workers who are worth keeping,	

<i>Psychological Problems of Business Men</i>	<i>Per Cent Having Problem</i>
but who are not interested in learning anything further in a school or a course	28.2
80. How to offer educational advantages to employees	27.6
81. Working men alone or in groups	26.4
82. How to secure accuracy from quick, nervous people who are apt to hurry an answer without actual verification	25.8
83. How to give employees opportunities for recreation	25.2
84. Selecting merchandise, not to please yourself, but to appeal to different types of customers	25.2
85. How to reduce fatigue	24.0
86. The amount of absenteeism to grant and whether women should be allowed more absences than men	24.0
87. Charting the organization	24.0
88. Selection of a name for a new product	21.6
89. How to make the most of busy seasons, as Christmas	21.0
90. How to stimulate friendly rivalry among employees	20.6
91. Maintenance of a suggestion box in the office	20.4
92. Settling disputes among executives	19.8
93. Annual picnic	19.2
94. Conducting contests among different departments	19.2
95. Conflicts with the union men	19.2
96. How to make a good impression on the manager	16.8
97. The employee who continually pads his overtime card	13.2

(2) *Psychology in war.* War involves inciting the masses to fight, and controlling them after they have been stirred to action. It means building up strongly emotionalized attitudes toward other people and situations, employing that powerful instrument of psychology known as propaganda. War psychology is an example of the way in which attitudes are built and destroyed. If psychology were used as well in many peaceful everyday situations as it is in war, society would profit immensely.

It is unfortunate that so much war psychology is employed for "negative" purposes. It is equally unfortunate that, in times of peace, terms which we apply to peoples of other nations are more

likely to be unpleasant than pleasant. In spite of the strong economic factors which enter into every conflict between nations, it is possible that the outlawing of war could be hastened by the use of terms to describe foreigners which have a pleasant rather than an unpleasant connotation.

(3) *Psychology in athletics.* In athletics, individual morale is a vital factor. Frequently the athletic coach is an applied psychologist as much as he is a lecturer on the technique of the performance involved. Knute Rockne knew this and capitalized it to the maximum. All successful coaches of today do the same. Max Starceвич, All-American guard in 1937 football, says: "I have never played against a man who at some time or other during the game didn't telegraph his intentions to me. Knifing through the line and downing a backfield man in the opposition before he has a chance of getting started with the ball is all a matter of knowing the psychology of the other fellow. If one little move that he has made has 'tipped you off' that he is going to go a certain way—and there are few of them that don't make that little move sooner or later—it is safe for a lineman to leave his position and make one of those plays that look so spectacular to you folks in the gallery. But just let him leave at the wrong time! He's a sucker, then, instead of a hero!"

Recent years have seen numerous articles in the weekly and monthly publications, written by players and coaches, testifying to the enormous significance of psychology in athletics and athletic competition. The moral is obvious. Young men and women who are contemplating any kind of extensive participation in athletic pursuits should learn how to study people as well as the game.

In addition to the psychology which interests the active participant in athletic competition, there is audience or spectator psychology, also. Men like Tex Rickard have the knack of understanding, after long study, public reactions to certain kinds of pugilistic personalities. Such knowledge is basic to building up the enormous shows which Rickard staged.

(4) *Psychology of religion.* The word *psychology*, by derivation, means "science of the soul," but that phrase is no longer a descrip-

tion even of the branch of psychology called the psychology of religion, which is concerned with the application of psychological principles to religious matters. Important parts of the psychology of religion are the psychology of conversion and the psychological handling of various religious problems. The fact that psychology enters into these situations implies nothing as to the verity of the fundamental religious teachings.

We see an example of the use of psychology in religion in the teaching of Sunday Schools. It used to be thought that, because of the intrinsic value of the religious content, no particular technique of Bible teaching was needed, and anyone who wished to do so could teach Sunday School. At the present time, some Sunday School superintendents make a definite effort to secure teachers who are psychologically as well as ethically and religiously informed and oriented.

(5) *Psychology of social life.* There are three principal elements, psychologically speaking, in effective adjustment to social life. These are: (1) knowledge of the folkways, (2) knowledge of how to influence people favorably toward oneself, and (3) the habit of observing, and interpreting correctly, minimal cues to the actions and attitudes of others.

Knowledge of mores is the basis of all manners and morals. One cannot determine by intuition what the mores are. They must be learned. It is likely that there are kinds of human conduct which would be offensive to everyone, in every place, at every time. Bodily assault might come under this heading. But our dislike of most conduct is probably learned. In this connection it should be borne in mind that a strong associative reaction or a strongly conditioned response is almost as powerful as a native or "instinctive" one. This holds of emotional responses, as well as of muscular and cerebral.

The ability to influence others favorably toward oneself is an obvious advantage, but we frequently observe people complaining about the "low levels" upon which human beings in general must be approached. One often hears criticism, for example, of the tendency of most people to react favorably to flattery. The social

idealist may lament such a state of affairs. The psychologist, however, is more concerned with determining what the conduct patterns that evoke favorable responses are and in employing such patterns.

Attention to small cues to action is a point of paramount importance and one that is too often neglected. Modern man in a so-called civilized modern environment does not act, customarily, according to his natural urges. These drives become concealed by a considerable amount of inhibition and substituted action. Everyone has, however, genuine emotion, emotionalized attitudes, and strong convictions on various issues. However well these may be concealed, it is impossible for most persons to cover them completely. Therefore, one who has become adept at recognizing minimal cues is in a distinctly advantageous position in the regulation of his own conduct.

(6) *Psychology in education.* Educational psychology is one of the most important branches of applied psychology. This arises partly from the fact that approximately thirty million children in the United States alone, at the present time, are engaged in the systematic pursuit of education through formal educative agencies, and partly from the fact that the formal period of education is the period of youth when the formation of attitudes and conduct patterns is relatively easy.

The psychology of teaching concerns every person. There is probably no one who has not been compelled to teach someone else. If courses in the psychology of teaching were as good as we should like them to be, it would be wise for everyone to take such courses.

The psychology of teaching involves: (1) knowledge of the thing which is to be taught, (2) a method of teaching it which will make it meaningful and interesting to the learner, and (3) a knowledge of the learner's previous interests and ability. It is easy to record these three requisites for successful teaching. It is more than difficult to fulfill all three. Of the three, probably the first is the most satisfactorily done. But common sense as well as experimental investigation assures us that mere aptitude in performance on one's own part

is no guarantee of the ability, acquired or native, to impart the same to another. If you are interested in trying to teach anyone, your first step is to check your mastery of the material to be taught. There is some excuse for uncertainty as to the other person's ability to learn or for some faltering in method, but there is little excuse for not having one's own knowledge and skill up to the highest level possible.

(7) *Psychology in medicine.* H. L. Mencken once said that quacks are ingratiating fellows. They frequently are just that. The ingratiating quacks and unscrupulous physicians become so because they are more interested in money than in curing people, and because they realize that an effective psychology of ingratiation is worth many dollars. Probably no one will ever know, since those who have suffered the most are not available for testimony, the cost of failure to apply psychology to medical problems. If the patient's state of mind is of any consequence at all (and it is, unless it has been shown beyond doubt, by medical experimentation, that this state of mind is in no way related to recovery), then the psychological problem in medicine cannot be evaded.

As this is being written, the writer is supervising an experiment on the effect of the personality of nurses on patients. The investigation is being conducted by a competent and trained supervisor of nurses. Preliminary results indicate that we can well give much more thought to the matter of training or selecting the proper personality for the job of nursing. A hospital patient, in a certain sense, is in an unnatural condition. Many of his reactions are reënforced in intensity. Successful care under these conditions requires not only a fairly high level of intelligence, but the interest and the experience to adapt successfully to a patient's whims.

The attitude which is found too frequently in both physicians and nurses, that the patient is an uninformed dolt, complaining needlessly or babbling about hypothetical discomforts, can lead nowhere. More than one physician minimizes his effectiveness by failure to give attention to trivial psychological details after having done a commendable technical job. In fact, one of the difficulties confronting those who are interested in applying more psychological

practice in medicine is the dogmatic and obdurate opposition of many physicians.

(8) *Psychology in law.* Legal psychology is one of the most fascinating of studies. If greater consideration were given by legislative assemblies to probable psychological sanctions of proposed legislation, there might not be on the statute books, as there now are, hundreds of laws that are not enforced, and are actually impossible of enforcement, because of adverse public opinion. The repeal of prohibition, regardless of its moral or ethical merits, is a striking example of the effect which psychological pressure can have upon legal issues.

Even more important, however, than the psychological considerations which enter into the making of laws is the psychology of crime itself. This problem cannot be described in detail here. Suffice it to say that investigation in the field of social psychology strongly indicates that crime is not hereditary, and that correct education is its best preventive. This education, in both school and home, must be psychologically sound, built upon the best knowledge of the psychology of the child and the adolescent. That education has not yet reached that stage is eloquently attested by the increase in crime of the last few decades.

(9) *Psychology in international relations.* A century ago, to have said that the whole world is one big family would have been true only in a vague sense. Man has discovered communicative media which can circle the globe seven or eight times a second. Thus, in the enormously influential sphere of exchange of ideas, the world is already one family or social unit. Travel is becoming more rapid every day. One can go halfway around the world by airplane in less time than it took, a century ago, to go from one city to the next.

With all parts of the world being drawn into closer and closer relationship, international understanding must grow in proportion. True international understanding must be based on comprehending the psychology of other peoples. But our technological advances have outstripped our psychological, and the development of sympathetic race understanding, instead of being fostered by new agencies of communication, is often thwarted by deliberate misrep-

resentation of other peoples through the press and similar channels.

(10) *Psychology in home life.* The psychological investigations of Freud, Hall, Gesell, and Watson have so emphasized the importance of early conduct patterns upon later behavior that the home, where these are formed, acquires a tremendous psychological significance. In the past, much effort has been centered upon the child, and much time given to moulding his character and personality and to minimizing criminal possibilities. We now realize that it is impossible to continue this effort successfully without always considering the home and the parents. Social workers, juvenile court judges, and students of criminology everywhere, witness this fact. Despite this fact, the psychology of home life has been dignified with little attention, and that mostly by sociologists. Social pressure will, in the long run, force the scientific study of home life.

The psychology of home life is a complex study of behavior adjustment. Home relationships, those of parent and child, the child and his brothers and sisters, are the background for many otherwise baffling personality problems and social adjustment cases.

QUESTIONS

1. What are some of the psychological problems related to college life and your own adjustment to everyday living?
2. Give a résumé of the history of psychological investigation.
3. Pick one of the men to whom reference is made in the section on the development of psychology and make a study of his writings.
4. Give several examples of your own use of psychology in buying or selling. What psychological traits do you believe are valuable in the business world?
5. What psychological factors are involved in team morale in athletics?
6. What are the really important factors in the psychology of social life?
7. Elaborate the discussion of "attention to small cues" as a factor in socialization.
8. Name eight or ten phases of modern life in which psychology is necessary.
9. Illustrate with some examples from your own home the importance of psychology in home life.

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CHAPTER II

PSYCHOLOGY AS AN EMERGING SCIENCE

NATURE AND PURPOSE OF SCIENTIFIC PSYCHOLOGY

A good notion can be gained of the varying current ideas as to what the proper province of psychology is by examining the viewpoints of a random sampling of the better known writers on psychology. Starch,¹ for example, emphasizes the factor of control of behavior as the major psychological problem. Griffiths lays considerable emphasis upon psychology as the study of probability. This is related in a way to the viewpoint of Starch, since control depends upon knowledge of probability of outcome. Bentley distinguishes nicely between the casual everyday observation of human conduct and scientific psychological scrutiny of the same behavior. He says:

The simplest way to distinguish the point of view of the psychologist from the personal view of everyday tradition is to observe that human beings are so constituted that they automatically assume, toward the world in which they live, at least three unlike and conflicting attitudes. These are the attitudes of knowledge, appreciation, and use. When a person inquisitively examines a new kind of engine or typewriter, puzzles out the meaning of a knotty sentence in a Latin text, follows a lecture in chemistry, or reads references in history, he assumes *the attitude of knowing*. All serious inquiries after knowledge imply this attitude.

Again, the concert, the opera, the ball game, the delights of friendship, the exhilaration of vigorous employment, the regard for human endeavor and human accomplishment, and the condemnation of wrongdoing, all imply the second attitude, *the attitude of appreciation*. When we appreciate, we enjoy, we judge, we condemn; in brief, we value.

Finally, man's employment of the world and its opportunities involves

¹ Daniel Starch, Hazel Stanton, and W. Koerth, *Controlling Human Behavior*. Macmillan, 1936.

the attitude of use. Tools and instruments are, as a rule, regarded under the attitude of use. They are means to an accomplishment of our ends. The mineral stores of the world, the mines of coal and copper, of gold and silver, we generally regard in a utilitarian way. Business and commerce, the demands of war, and the conquest of a new land, encourage men to assume the attitude of utility in order that they may accomplish their desires and command both nature and the fortunes of their fellows.

Toward many of the affairs of life and toward most of the world's objects we assume at different times and for various purposes all of these three major attitudes. We *know* the animal as a representative of such or such a zoölogical group, we value and *appreciate* it as a pet or companion, and we *use* it as a burden-bearer and for food. The soil we study; the landscape we enjoy; and the land we compel to yield an income. The heavens themselves furnish the astronomer with materials for study and the mariner with useful points of reference, as well as all of us with the loftiest objects that stir the imagination.¹

Murphy² emphasizes the interaction of the organism and the environment with special emphasis on the totality of both situations; Kantor³ also treats interaction from the organismic standpoint.

It would be erroneous to assume that scientific experimental psychology attempts to discover forces or phenomena that are metaphysical or superhuman in nature. In general, it would be correct to say that scientific psychology, in one sense, is a refinement of common sense. There are, however, three major differences between everyday ordinary observation and psychological experiment. These are: (1) Casual observation is seldom recorded systematically, whereas records in objectively defined units are carefully kept in a controlled psychological experiment. (2) Everyday observation is likely to be made over a heterogeneous, unselected series of events, whereas psychological experimentation is usually based on the principle of random sampling from a series of homo-

¹ Madison Bentley, *The New Field of Psychology*, pp. 4-5. Appleton-Century, 1934.

² Gardner Murphy, *A Briefer General Psychology*, p. 12. Harper, 1935.

³ J. R. Kantor, *A Survey of the Science of Psychology*, chap. I. Bloomington, The Principia Press, 1933.

geneous phenomena. (3) Ordinary observation is usually transitory in nature, whereas controlled psychological experimentation often takes place over a longer period, permitting the establishment of a better cause and effect relation.

DEFINITION OF PSYCHOLOGY

Although there are many definitions of psychology given by different authors, there is reasonable agreement among them on the salient facts. Mention has been made in the preceding section of some of the viewpoints. Usually the following factors are included in the definition of psychology: (1) that it is an experimental science, (2) that it states its results in objectively defined units, and (3) that it establishes certain relationships with predictive possibilities. Stevenson Smith ¹ puts it well when he says, "The practical function of science is to predict the future and explain the past."

With these criteria in mind, it is now possible to attempt a definition of psychology. *Psychology is the systematic, scientific study of behavior and conduct by a method appropriate to the phase of behavior or conduct being studied and with the special purpose of predicting and controlling behavior and conduct sequences.*

The student should note that this definition emphasizes, first of all, that psychology is not a sporadic, isolated phenomenon. It is a continuous and progressive type of refined observation. The phrase, "by methods appropriate to the phase of conduct being studied," needs a word of explanation. The thought is this: some forms of behavior on a low physiological or mechanical level can be studied in a highly objective and measurable way. A sense organ—the eye, for example—is rather thoroughly understood both as to structure and function. The nature of dreams, or a problem like dementia praecox, cannot be studied in the same satisfactory, objective way. If such phenomena are to be studied at all, it must be by a less objective technique.

The emphasis upon prediction in the definition given is one which a moment's reflection justifies. Many times a day, and thousands of

¹ Stevenson Smith, "Schools of Psychology," *Psychological Review*, vol. 38 (1931), pp. 461-473.

times a year, we are forced to make decisions in which a judgment is necessary on probable outcomes. Will the stock market go up or down tomorrow? Will the sun shine or will it rain? Will one get an increase in salary or not? Questions like these, and many others, must have an answer, and that answer must be in predictive terms. Sometimes the decision must, of necessity, be almost sheer guesswork; but sometimes the data are at hand for a much better prediction than one actually makes. It is with the action in which a reasonable predictive possibility exists, and in which only ignorance of the facts and technique causes inaccurate conclusions, that we are here concerned.

From the beginning, in our discourse, we have confined ourselves to a discussion of scientific psychology. We have defined psychology itself as an objective experimental science. Of course, there are many other kinds of psychology and psychologists. The man who comes to your town and lectures on "How to Overcome All Fear," and "Become an Interesting Personality and a Millionaire," in ten lessons, calls himself a psychologist. The person who reads your character and tells you what business you will succeed in calls himself a psychologist. Probably there are more such psychologists than there are of the conservative experimental type. Therefore, if we are really to understand scientific psychology, we should examine at this point the kinds of psychology and pseudo-psychology.

KINDS OF PSYCHOLOGY

It is easy to suppose that scientific psychology is necessarily interesting and helpful to the average man. This is not always the case. As a matter of fact, much psychological experimentation is criticized as being impractical, dealing as it does with topics in which the public is not interested. Furthermore, a person in need of practical psychological counseling sometimes gets more value from a pseudo-psychologist than from a real one. Guthrie says on this point:

It is easy for the physicist to out-prophecy the false prophet and to out-do in clearness the explanations of the quack. It is less easy in psychology and in medicine where these gentry flourish, because psychol-

ogists and physicians cannot always demonstrate their superiority and, in fact, do not always possess it. An expert psychologist often turns out to be less right than the man of practical experience.¹

Pseudo-psychologists concern themselves with a wide variety of topics, most of which have to do with the social effectiveness of the individual and the well-nigh universal human craving for monetary advantage. This is shown by the list which Yates² has given of topics which pseudo-psychologists discuss. The list is based upon the topics given in ten of their advertising circulars. (See page 26.)

The following are some familiar kinds of pseudo-psychologists:

(1) "*Character*" analysts. Those who claim to analyze "character" do it in several different ways. Some use graphology or the study of handwriting. Some read facial features. Some consult the stars. There is just enough accuracy in character analysis, by the methods used, to be interesting to many people. No one denies that within certain limits the nature of one's life leaves its mark upon both physical appearance and dress. A shrewd observer can draw a considerable number of sound conclusions simply on the basis of sharp observation. Character analysts, however, although they are shrewd, never stop within reasonable limits. Instead, they undertake to foretell the future, and to predict the occupation to which your kind of character is best suited. This is something about which the best guidance experts in the world are still uncertain.

(2) *Spiritualists*. Many spiritualists claim to be psychologists. They maintain that they are restoring psychology to its proper sphere, that of studying the mind and spirit. The spiritualistic pseudo-psychologist talks about mystical forces that we can bring under our control if only we will to do so. He points significantly to the fact that science now utilizes forces, such as radio, that a few hundred years ago were unknown, and tells you that he is going to

¹ E. R. Guthrie, "Psychological Principles and Scientific Truth," *Proceedings of the Twenty-Fifth Anniversary Celebration of the Inauguration of Graduate Studies*, edited by H. W. Hill, pp. 104-115. University of Southern California, 1935.

² D. H. Yates, *Psychological Racketeers*, pp. 55-58. Boston, Richard G. Badger, Publisher, The Gorham Press, 1932. Courtesy of Chapman & Grimes, Inc.

TABLE I. TOPICS DISCUSSED BY PSEUDO-PSYCHOLOGISTS

<i>Chief Topics in Circulars</i>	<i>Number of Circulars</i>	
How to get what you want	10	(100%)
Success	10	"
Health	10	"
Happiness	10	"
Money, financial success, or wealth	9	(90%)
How to waken (or develop) your hidden powers	9	"
The subconscious mind	9	"
Concentration	8	(80%)
How to be popular	8	"
Magnetism	8	"
How to get rid of fear, or fear and worry	8	"
How to heal yourself and others	8	"
Rejuvenation	8	"
Prosperity	8	"
How to develop personality	7	(70%)
Suggestion (and sometimes autosuggestion)	7	"
Memory training	7	"
Will power	6	(60%)
Business success	6	"
Health, happiness, success (grouped in a phrase)	6	"
Power	6	"
How to read people at sight	6	"
Telepathy	6	"
How to find, or understand, God or religion	6	"
Character analysis by lecturer	6	"
Scientific exercises	6	"
How to make your dreams come true	5	(50%)
How to attract what you want (the Law of Attraction)	5	"
Love	5	"
Imagination	5	"
(Original) knowledge	5	"
Self-confidence, or self-reliance	5	"
Salesmanship	5	"
How to get rid of complexes (or repressions)	5	"
How to cure bad habits	5	"
Vocational guidance (by lecturer, or by self alone using lecturer's methods)	5	"

TABLE I—*Continued*

<i>Chief Topics in Circulars</i>	<i>Number of Circulars</i>
Types of people.	5 (50%)
Sex information.	5 "
Glands (endocrine).	5 "
What you should eat, or scientific eating.	5 "
Scientific breathing.	4 (40%)
How to get rid of fatigue.	4 "
How to grow brains.	4 "
Mastery of fate.	4 "
Ability at public speaking and in conversation.	4 "
How to attract friends.	4 "
Psycho-analysis.	4 "
Self-analysis.	4 "
Interpretation of dreams.	4 "
Visualization.	4 "
The Silence.	4 "
Peace and contentment.	4 "
Poise.	4 "
Harmony.	4 "
Domestic happiness.	4 "
Character development.	4 "
The Law of Vibration.	3 (30%)
Sleep.	3 "
How to cure nervousness.	3 "
Emotional control.	3 "
How to protect yourself against the mental influence of others.	3 "
How to be attractive to the opposite sex.	3 "
How to be beautiful.	3 "
How to know whom to marry.	3 "
How to help children (through suggestion, etc.).	3 "
Long life.	3 "
Authorship.	3 "
Inspiration.	3 "
Intuition.	3 "
Prayer.	3 "
Abundance.	3 "

place you in command of similar and more powerful forces. One of the amazing things about some of these pseudo-psychologists is, as Guthrie points out in the quotation given, that they actually get results. It is entirely possible for a person with a pronounced inferiority complex to visit a spiritualistic psychologist and be given a treatment of ego-inflation which readily produces a notable change in personality.

(3) *Mental hygienists*. There is, of course, a legitimate field of mental hygiene. Although it is a young emerging science, psychiatry is deservedly getting increased attention from both physicians and psychologists.

The pseudo-psychiatrists, on the other hand, point the wavering, bony finger at you from advertisements and say, "Are you afraid?" It appears that if you are afraid of anything under the sun, all you need to do is to take the scissors and clip the coupon and mail it. You will receive something, usually a price list of lessons or books, which will tell you how to stare lions in the eye and send them shrinking into a corner of the cage with their tails between their legs. It should be noted at this point that many of the pseudo-psychologists are working by remote control, so to speak. They work by mail, and the postal regulations, excellent as they are, cannot stop some material of this sort from going through the mails. Consequently, the man who is going to tell you how to beard the lion in his den, seldom has to demonstrate the technique he advises.

(4) *Health experts*. Reputable physicians stress the fact that psychological factors, such as worrying, can aggravate or perhaps even cause disease. Beginning with this truism, the pseudo-health-expert expands it ad infinitum. Not only that; he also claims to have a sure cure for all forms of psychological imbalance. Fortunately, the individual who takes the treatment usually wastes only his time and money. Occasionally, however, he actually damages himself by delaying competent diagnosis and treatment.

(5) *Mystics*. The mystic plays up an exciting, esoteric appeal. He claims to come from far lands and be the master of wonderful and ancient lore. For a consideration, he is willing to share this

vast background of knowledge. Oriental names, flowing robes, red turbans, and incense are part of their stock-in-trade. Usually their antecedents can be found in Indiana rather than in India, and in New York rather than in New Guinea.

(6) *Success experts.* The success expert beams confidence. He is going to tell you how to make a million dollars in a hurry. You can't go wrong. Thousands of others have done it. It is a pity that more people do not look up the credit rating of the success expert before they listen to what he has to say.

(7) *Sex experts.* Sex problems are interesting to most people. Like death and taxes they are likely to come to everyone sooner or later. Consequently, the sex psychologist knows that he will always have a clientele.

It is a fact that some sex psychologists do give advice which is by no means worthless on questions involving sex behavior. But by far the best—and in the long run the cheapest—place to get such advice is from one's pastor, or from a reputable physician. They do not play upon ignorance, and they can be counted on to keep professional matters to themselves.

Some of these admonitions seem almost foolish, they are so simple. Anyone who knows the facts, however, or has the acquaintance of a really successful pseudo-psychologist, knows how long the list is of persons of money, intelligence, and education who patronize these people.

We come now to the major categories of reputable psychology. Differing classifications are offered. The following encompasses the major divisions with a brief description of each:

(1) *Comparative, differential, or animal psychology.* There are manifest advantages to experimentation on animals, regardless of the extent to which the results can be applied to the interpretation of human affairs. Conditions and variables can be rigidly controlled in animal experimentation. Motivating drives such as starvation can be freely employed. Experimental psychology tends to utilize animal experiments for these reasons.

(2) *Genetic psychology.* Genetic psychology is the study of development. It investigates intensively growth, motivation, develop-

ment, adult abilities, senescence, deterioration. Teachers and others who deal with children are especially interested in it.

(3) *Social psychology*. Social psychology is the study of the behavior of people in groups. It is obviously related to sociology. In the past, sociology proper has confined itself more to study of social institutions than to study of the individuals making up the groups. Recent years, however, have seen sociology and psychology come closer together in the field of social psychology, and at present it is difficult to tell in which division social psychology belongs.

(4) *Abnormal psychology*. Abnormal psychology is a most important field of investigation. As human affairs become more complicated, the difficulties of communal living become emphasized. The person who is strikingly different or abnormal is likely to become a social charge. The behavior of a hermit, as judged by a social norm, can be decidedly eccentric and yet make little difference to society, one way or the other. The same behavior translated into a social milieu is a problem. Abnormal psychology investigates the causes, nature, and prevention of abnormal conduct, defined socially.

(5) *Applied psychology*. Examples of applied psychology are the psychology of advertising and the psychology of teaching. An extremely clever person, or one well versed in the field of psychology, can take the general principles and apply them to specific situations with little or no special training. There are many people, business executives for instance, who are not interested in academic, theoretical psychology, but who nevertheless wish to use psychological principles in the discharge of some responsibility concerned with their duties. All individuals of this class should be interested in applied psychology.

The newly organized American Association of Applied Psychology at present includes four sections: educational, clinical, consulting, and industrial.

SCHOOLS OF PSYCHOLOGY

Discussion of schools of psychology is not easy. The problem, however, is much more complicated from the linguistic than from

the laboratory side, as Smith ¹ has pointed out. Ogden ² has emphasized the same thing in his discussion of the double language hypothesis.

There are many ways of attacking the problem of human behavior. For the most part the differences are those of method, but there are likewise different ways of describing results, once found. Both kinds of difference have led to what are known as "schools of psychology." Actually, the main objective is the same in essential aspects, and the student should not jump to the conclusion that the whole field is in a condition of uncertainty simply because men are attacking different problems from different angles. It is as though a little child, a zoölogist, and an artist were to go to the circus. Let us say that each attempts to describe the elephant. The little child's language is descriptive, but naïve. It is likely to define the elephant in terms of function, as a big animal that eats peanuts. The zoölogist will incline toward giving a phylogenetic classification of the elephant, with perhaps a few memoranda on structural morphology. The artist is likely to be interested in coloration, and the kind of line combinations which would most nearly resemble the elephant. Yet they all saw the same elephant, and all their descriptions are true and meaningful.

Another factor that bears on the classification of schools is the extent to which some psychologists attempt to simplify psychology. The behaviorist is inclined to say, "If I can't see it and measure it objectively myself, it isn't a matter of concern to me as a man of science." This rigid delimitation naturally results in a list of topics which is less lengthy and different in content from that of the person who defines the field in terms of the subject's description of what is happening inside him—of what he sees and feels and imagines.

A prolonged discussion of schools of psychology would be out of place in this volume,³ but the names and general viewpoints of the schools should be given for background information.

¹ Stevenson Smith, *op. cit.*, pp. 461-473.

² C. K. Ogden, *The Meaning of Psychology*, p. 26. Harper, 1926.

³ Those who are interested in more detailed discussion of this topic are referred to C. E. Ragsdale, *Modern Psychologies and Education*, Macmillan, 1932, and Edna Heidebreder, *Seven Psychologies*, Appleton-Century, 1933.

(1) *Behaviorism*. Behaviorism stresses objectivity in investigation, with emphasis upon physiology and neurology. It studies those types of behavior which can be measured and stated in objective units. It leans away from description of psychological phenomena in terms of mental qualities.

(2) *Mental psychology*. Mental psychology is usually dualistic; that is, it holds for both a mind and body acting either as parallel functions or as interacting functions. Mental psychology uses introspection as a method and builds its descriptions of psychic states on a hierarchy of perception.

(3) *Organismic and Gestalt psychology*. Organismic psychology stresses the study of the entire organism in its place as a part of a reciprocally interacting environment. Organismic psychology also emphasizes adjustment as a phenomenon of behavior.

Gestalt psychology emphasizes the dynamics of behavior.¹ Gestalt holds also for what Köhler calls "relative properties" of stimulation as against isolated, absolute sensory attributes.² The Gestalt theory of learning stresses the factor of "insight" or one-trial solutions and minimizes many phases of so-called trial-and-error learning.

RELATION OF PSYCHOLOGY TO OTHER SCIENCES

(1) *The relation of psychology to biology*. Human biology is the study of man, and psychology is one of its branches. Many psychologists have always believed that a knowledge of the biological nature of man is the necessary first step toward understanding his psychological nature. In the first paragraph of the first chapter of his *Behavior, An Introduction to Comparative Psychology*,³ J. B. Watson states the case for psychology as a branch of natural science, of which biology is the leading component. The biologist has amassed a tremendous array of data of psychological significance. In fact, if biology were defined broadly enough, some psychologists

¹ Wolfgang Köhler, *Gestalt Psychology*, chap. IV. Liveright, 1929.

² *Ibid.*, p. 147.

³ J. B. Watson, *Behavior, An Introduction to Comparative Psychology*, p. 1. Holt, 1914.

would be willing to view psychology as coming under the general rubric of biology.

(2) *The relation of psychology to sociology.* Sociology may be defined as the study of the behavior of man in groups, and of his institutions. Thus, sociology and psychology seem to be intimately related. In the past, sociology has emphasized groups and institutions, but the recent developments of social psychology have re-directed the emphasis toward man.

(3) *The relation of psychology to physiology.* Physiology may be defined as the scientific study of the differential functions of the body or of the organism. Although most psychologists emphasize the functioning of the organism as a whole in describing it psychologically, it is obvious that special functions of the various parts are directly involved. We do not have a description of human action and human motives even after we have a picture of the action of the heart, liver, digestive system, and other organs and systems.

(4) *The relation of psychology to neurology.* Neurology is the study of the nervous system. The modern viewpoint of psychology attempts to reduce behavior and conduct to objective terms which draw heavily upon neurology. Nerve structure and function are the basis of behavior. Chapter III will describe some of the neurological principles of importance in psychology.

(5) *The relation of psychology to mathematics.* In modern psychological investigation, large groups of individuals are sometimes measured. This necessitates the statement of findings in objective units. Such a statement involves the use of a branch of mathematics called statistics. Statistical method, as employed in education, psychology, and sociology, is an exercise in applied mathematics. Thus, mathematics has been of inestimable value in advancing the science of psychology.

PSYCHOLOGICAL TECHNIQUES OF GATHERING DATA

(1) *Experimentation.* Many problems that could be settled by experimentation are argued endlessly. The inclination of the scientist is to set up a situation under controlled conditions and to try

things out. For example, if one is curious about the effect of instruction on efficiency in golf playing as measured by score, one way to get at the problem is to talk about it. Another way is to get two groups of about a hundred golfers, each group selected at random, and have one group practice with instruction and one without, equalizing such factors as interest, time of practice, and the like. Scores of the groups on later performances could then be compared, and reasonable inferences be drawn concerning the value of instruction.

(2) *Observation*. Observation has long been a method in psychology. Of late, it has come in for criticism by scientific psychologists. The kind of observation that is usually criticized, however, is the casual, unsystematic, unrecorded observation of the untrained observer. The observer who has been trained in strict attention to detail, and who has a keen memory, can gather a respectable amount of psychological data.

(3) *Introspection*. Loosely speaking, introspection is the method of observing one's own inner behavior, especially the mental states and processes. Introspection fell into disrepute when the behaviorists were in the heyday of their influence; but at present it is rather widely used as an adjunctive technique. For example, Stevenson Smith says: "Insofar as the language of introspection has been given meaning by its objective setting, such language refers to, and reveals, the objective order for men other than the verbalizing observer. Because of this, there is much introspection that is significant, and indeed essential, for objective psychology."¹

(4) *Biography*. Not only is the study of the whole man an important point in psychology, but the whole life of the whole man is likely to be of value in presenting clues for prediction of behavior. A study of family histories, as conducted by Galton and others who have studied similar problems, shows possibilities for such prediction.²

¹ Stevenson Smith, *op. cit.*, p. 468.

² A citation of material of this sort may be found in M. F. Guyer, *Being Well Born*. Bobbs-Merrill, 1927.

PSYCHOLOGICAL TECHNIQUES IN TREATING DATA

(1) *Statistical*. Reference has already been made to the use of statistics in handling psychological data. It is a valuable aid in the treatment of objective material. For a student who intends to advance to graduate work, at least two courses in statistics will prove very valuable.

(2) *Logical*. Logic is becoming a lost art. Once required in the education of every cultured person, it is now studied only casually and incidentally, if at all. It should be restored to a position of much greater respect. Words are tricky. In the hands of a master of sophistry they become still trickier. Carelessly used by the psychological novice, they are deceiving. Logic and its study enable one to guard his speech in drawing conclusions and discussing relationships.

(3) *Philosophical*. Psychology used to be the "handmaiden" of philosophy. Some philosophers say that it might well remain so. Philosophy may be defined as the study of the nature and purpose of life. Only the narrowest of psychologists fail to see a relationship between the data they gather and translation of those data into the more general terms of philosophy. Certainly, for the organizer, such as a person charged with the responsibility of building a school curriculum, a philosophy of life is necessary.

DIFFICULT PROBLEMS OF PSYCHOLOGY

In this section we shall briefly indicate some of the general problems in psychology which have proved puzzling over the years.

(1) *The relation of heredity and environment to conduct determination*. What is the prime basis of conduct? To what extent have we been moulded to what we are by our environment, and to what extent are we "just naturally" that way as a result of hereditary factors and the natural processes of growth?

Some people consider such questions futile, because it is impossible to separate the effect of heredity and environment in the conduct of any person, and it is generally conceded that the individual is the product of both. There are many cases, however, where

judgment is necessary. Take the person who is talented musically. Some teachers maintain that very much interference with talented pupils through the medium of teaching, which is a form of environment, is unwise. Natural talent will develop itself by practice with the tools.

(2) *Will*. Is there really such a thing as making a choice? Does "free will" exist? This is an old question in theology, and most religious conversions are made on the assumption that it is within an individual's power to make choices. Not all psychologists believe in an absolute free will, however. Neither do all lawyers. In one of the most famous murder trials in history, a competent counselor saved the lives of two men on trial for murder, whose guilt had been proved, by consistently maintaining that they were the helpless victims of their previous training, environment, and heredity and that it was impossible for them to have made a free choice of murder.

(3) *Transfer of training*. Does the mind work like a muscle? If one studies Greek and calculus and other hard mental "disciplines," will his mind be strengthened so that he can the more easily solve all problems?

Many school subjects retain their place in the curriculum on the assumption of the existence of mental discipline, or, to use the more modern term, the transfer of training from one situation that it may be available in others. Since the days of William James this doctrine has been under fire, but many teachers still believe in automatic transfer. Recent experimental evidence established the fact that transfer takes place, but in small amounts, becoming smaller the more unlike the new situation is to the one in which the individual has been trained.

(4) *The mind-body problem*. Is there such a thing as mind, and if so, does the mind act independently of the body? Or do the mind and the body influence each other?

References to the influence of mind over matter, common even in everyday speech, bear testimony to the recognition of this problem. Some philosophers believe that everything is mind or ideas, that nothing exists except in the mind of the observer and that all else

is mere illusion. Materialists believe that all is matter, that the mind is simply a manifestation of matter. If all this sounds a little "hazy" to you, remember that we are now considering psychology's most difficult dilemmas, which are primarily philosophical, though they have certain psychological implications.

(5) *Instincts*. Man is an active creature; we all know that. But what is it that makes him go, aside from the general principle of life itself? Are the strong urges which reside within the body pointed in certain directions? Or is there a general driving force which can be turned in any one of a hundred directions? This is the problem of instinct.

There are those who feel rather sure that human urges are pointed in definite directions, and further that they are tied up solidly with the emotions. These psychologists usually believe in a considerable number of instincts which are named and described in detail. Drever, for example, has such descriptions.¹

(6) *The nature of thought*. Are there such things as thoughts? Does the fact that nobody has ever seen a thought prove that they do not exist? Can thoughts be transferred without sensory intervention?

The nature of thought is still a subject for lively speculation by reputable psychologists. A professor of applied psychology in a large university recently conducted extensive experiments on telepathy over the radio. The experiment was eagerly participated in by hundreds of people. The results were, as usual, ambiguous. In a few cases, slightly better than a chance result seemed to be obtained.

(7) *The nature of personality*. Why are some people more interesting than others? Of course, some people seem interesting to us because they possess traits that we like and to which we have grown accustomed. But there are some qualities which seem to appeal to almost all people. What is the essence of the illusive thing we call personality, and to what extent can it be voluntarily altered?

Personality is well worth study. It is always mentioned as a

¹ James Drever, *Instinct in Man, A Contribution of the Psychology of Education*. Cambridge University Press, 1917.

factor in success. A recent study¹ of the efficiency of teachers, conducted by asking the students to rate teaching traits, throws much emphasis upon personal traits. The human equation in salesmanship is generally conceded to be as significant as any other single factor, not excepting knowledge of one's product. We shall presently examine, in another chapter, the nature of personality and how it develops.

PRACTICAL PROBLEMS OF PSYCHOLOGY

(1) *Learning*. One of the major topics in psychology is the nature of learning. The extent to which learning can be influenced and the way in which this is done are also of interest. The differences between people and their native equipment for learning must be studied.

(2) *Psychology of suggestion*. Suggestion is a powerful instrument of conduct control. Individual command of technique ranges all the way from the crude, blunt hint of the sort that is referred to as "having a house fall on one," up to the level of suggestive control in which the person whose actions are being influenced is hardly aware of the fact. Hypnosis is a form of suggestion, and makes an interesting study in itself.

(3) *Psychology of relaxation*. Ours is an age and day of tension. Happy, indeed, is the person who can relax. His mental state is better as a result of his ability to relax, and so is his efficiency. Relaxation does not take place by accident. There is a technique to it, as Jacobson has amply proved.² From the standpoint of personal efficiency and health, no psychological technique is of more practical value than relaxation.

(4) *How to study*. We study not only books but people. He who studies people with certain psychological principles in mind profits thereby. Attention will be given presently to the psychological factors involved in study of both books and people.

¹ Mable K. Stromme, *Psychological and Sociological Factors in Guidance of Students at the Junior High School Level*. Thesis for M.A., University of Washington, 1937.

² Edmund Jacobson, *Progressive Relaxation*. University of Chicago Press, 1929.

(5) *Motivation*. Motivation implies interest and a goal. Interest suggests attention. Attention means results in learning.

(6) *Mental hygiene*. Psychiatrists tell us that the present age is a period of unusual stresses and strains. Perhaps we are getting a little more careless than we used to be about whom we call maladjusted or unbalanced, but unless this is so, nervous disorders are more common. But becoming "neurotic" or keeping from it is to a certain extent a learned reaction. Many noted psychologists subscribe to the thesis that abnormal conduct and insanity are frequently the result of learning. Generally speaking, that which can be learned can be "unlearned," although it is better not to learn incorrectly in the first place than to have to unlearn. Mental hygiene might be defined as the science of preventing learned nervous and mental disorders.

TECHNIQUES OF CONDUCT CONTROL

Everybody wants to know how to control other people. We realize this interest, not only from casual observation, but from the number of books which have been written dealing with the topic.¹ In this section, we intend merely to mention, in a general way, certain techniques of conduct control which will be discussed later in the book.

(1) *Force*. Force is a venerable method of getting other people to do what one wishes. The caveman used it and it is still a factor in human affairs. When nations use it, we call it war.

(2) *Deceit*. Deceit is trickery. Probably no one ever lived who has been entirely guiltless of having used deceit in one form or another at some time. Deceit has been viewed in various ways. Some of the ancient Greeks admired it, and that is why they thought the wily Ulysses a hero, though he was one of the trickiest men in all history or literature.

¹ Cf. H. A. Overstreet, *Influencing Human Behavior*, Norton, 1935; Wendell White, *The Psychology of Dealing with People*, Macmillan, 1936; and E. T. Webb and J. B. Morgan, *Strategy in Handling People*, Garden City Publishing Company, 1930. A more recent book than these three is Dale Carnegie's *How to Win Friends and Influence People*, Simon and Schuster, 1937, which has had a tremendous sale.

(3) *Suggestion*. We have mentioned suggestion above as a practical topic for psychology. We shall have more to say about it in the chapter on social behavior.

(4) *Social pressure*. Social pressure is a powerful conduct control. Few persons are able to hold out long against social pressure. Leaders of the masses have invariably been masters of the technique of manipulating social pressure; sometimes this is done through mass propaganda and control of education in the newspapers. An important adjunct, of course, is personal magnetism of the leader.

(5) *Appeal to prejudice*. Everyone has strongly emotionalized attitudes which are definitely influential in determining action. One of the most frequently employed means of influencing action is by appeal to these emotionalized attitudes. In fact, it is the commonly accepted method of political maneuvering.

(6) *Fear*. Fear is not an especially desirable or commendable method of controlling the conduct of another, but it must be admitted that it is an effective one. Dictators are said to use it as the main instrument of individual and group control.

(7) *Rationalization*. Happily, there are many people whose lives are governed more by reason than by fear or by prejudice. In dealing with such a person, the proper appeal is to reason. We should educate ourselves, so far as possible, to operate on this basis.

QUESTIONS

1. Quote the definition of psychology given in this text. Explain or modify it in your own words.
2. Can you justify the "psychological faker"?
3. Name five examples of applied psychology.
4. In what ways do the existing schools of psychology agree, and what are their main differences?
5. List and explain the practical problems of psychology and add to them from your own observation if possible.
6. What do you wish to learn from psychology from the practical standpoint?

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CHAPTER III

FOUNDATIONS OF BEHAVIOR

INTRODUCTION

Human conduct may be regarded as the activity of the human organism in relation to its environment. Psychology has been defined as the science of human behavior, and as psychological concepts have become increasingly objective, increased attention has been given to the make-up of the reacting organism. Behavior or activity cannot exist in isolation; when one says "psychology" helps in predicting behavior, he surely does not mean that a person's actions occur in isolation. Even such a mechanistic set-up as the stimulus-response is predicated upon a stimulus which is part of the organismic environment, and the response called forth becomes a part of and changes the existing environment.

This chapter will give some of the salient factual background for a scientific evaluation of human behavior. A warning is often sounded that, in such a treatment, one tends to ignore the forest by too close observation of the trees; but no one can criticize a tree surgeon for wanting accurate information about the structural details of a single tree. Nor can it be said certainly that this knowledge need interfere with his perspective in viewing tree grouping, or indeed the whole forest.

We shall inspect some detailed structures and their processes, not because they are individually significant, but because they contribute materially to a better understanding of the human organism and its function. This knowledge in turn should assist in developing a serious attitude toward the prediction of human attitudes and behavior in general. It should be borne in mind that human behavior is an objective phenomenon and consists of cause and effect sequences as do other objective phenomena.

DETERMINANTS OF BEHAVIOR: I. SOMATIC BASES

A. Receptive Basis of Behavior

(1) *The sense organs as receptors.* That the human organism be "alive to" its environment or, more specifically, sensitive to outside stimulation is the first necessity to interaction, reaction, or "behavior." As Dashiell says: "No expression without impression; no response without stimulation. A man does nothing, is not active, in any manner involving the effectors . . . , unless in some way he is being influenced by energy changes occurring inside or outside of him, which play upon his receptors—provided we except a few cases of smooth muscle and gland excitations by hormones." ¹

The bodily structures specialized for receiving environmental stimuli are the sense organs. Modern psychologists say there are at least ten important types of sense organ, but continue to observe with greatest interest the same old five senses listed by Aristotle—sight, hearing, smell, taste, and touch. These "senses" refer to the functions of the eye, ear, nose, tongue, and skin. Each of these organs is possessed of highly specialized receptors, differentiated and exclusive in function; that is, only one type of energy is received by each. We cannot receive sound waves through the visual receptors, but only through those of the auditory organ. Exceptions to this will be noted in the separate discussions of the external receptors.

The sense organ receptors are not the only receptive determinants of behavior. Sherrington ² classes receptors functionally as (1) exteroceptive: the external sense organ receptors; (2) interoceptive: those of the inner surfaces of the body and the alimentary canal, which include thirst, pain, and temperature receptors; and (3) proprioceptive: receptors located between the external and internal surfaces—that is, in muscles and glands. Here activity is due to stimuli provided by the organism itself. Muscle action, for example,

¹ J. F. Dashiell, *Fundamentals of Objective Psychology*, pp. 79–80. Houghton Mifflin, 1928.

² C. S. Sherrington, *The Integrative Action of the Nervous System*, pp. 316–319. Yale University Press, 1906.

affects the proprioceptors and sets up impulses which lead to the organism's awareness of the action in progress and appropriate continuation of it.

(a) *The visual receptors.* The energy of light probably provides more stimuli influencing human behavior than any other single source. Light striking the retina of the eye activates the special receptors of vision, minute rods and cones.¹ While the functions of the dual visual receptors have long been disputed, most neurologists consider the rods as light receptors only, and the cones as sensitive to both color and light. "Rod" vision gives the blacks, whites, and grays of the environment, and is sometimes referred to as "twilight vision." The rods, according to Howell, send impulses to the brain through fibers probably common to several of them. "Cone" vision accounts for the variety of hues and color. Entire or partial color-blindness is due to a lack or disturbance of function in the cone processes. In Howell's representation of the human retina, each of the cones makes a connection with the brain through a separate fiber.

(b) *The auditory receptors.* After vision, hearing is probably the most determinative sense from the standpoint of the individual's contact with the outer world; the world of sound provides a wealth of stimulation. The voices of those about one, the noises of complex city life, the music of nature and of man, are dominant behavior-affecting media. The form of energy they represent is sound, which travels in waves from its source and is received by the human ear.

Some knowledge of the anatomy of the ear is fundamental to understanding of the auditory process. We shall give only a simple picture of the structural mechanism, emphasizing the receptor process.

The receptors affected by sound, or vibrations in the air, are the hair cells located in the inner ear, or cochlea. The sound waves travel through the pinna, or outer ear, and the tympanum, or ear drum, and are transmitted by the three small bones of the middle ear, known as the hammer, anvil, and stirrup, through a membranous window into the vestibule descending into the inner ear, or

¹ W. H. Howell, *A Textbook of Physiology*, p. 356. Saunders, 1921.

cochlea. When the vibration reaches the cochlea, activities occur in the hair cells, which start nervous impulses directly to the brain. Hunter ¹ gives the range of ability to receive and transmit sound to the brain for the receptors of the human ear from eighteen complete vibrations per second, to a frequency of 15,000 to 22,000 complete vibrations per second. There are frequently found "tonal gaps" within a given individual's auditory range; that is, some frequencies of vibration are not heard or have no effect upon behavior.

(c) *Taste and smell receptors.* These receptors are considered jointly, not because they are the same, either in location or structure, but because of their interacting relationship in their effect upon behavior. As Hunter points out, "the receptors in the nasal cavity and those in the mouth cavity are so closely related that it is often difficult to determine which of the two groups is controlling behavior." ²

The receptors for taste are specialized cells found in the taste buds. These pear-shaped structures are scattered in the moist tongue surface, and are connected with cranial nerves. The taste buds are missing in the middle upper portion of the tongue in the adult, though present in the child, who also has taste buds in portions of the cheek, not active in the adult. The stimulus for taste is supposed to be a chemical solvent. Although there is no structural differentiation in taste receptors, varying functional classifications may be demonstrated. These are localized responses to different qualities of the stimulus: (1) sweet, at the tip of the tongue, (2) sour, at the edges, and (3) bitter, at the back of the tongue. The same solution applied to different parts of the tongue calls forth different responses. From this standpoint the sense of taste is relatively undependable.

The nasal cavity contains the smell receptors, spindle-shaped cells localized in the mucous membrane of the upper part of the nasal passages. The olfactory nerve has its endings directly in the receptor cells; that is, these cells are really neurons, according to some physiologists. The stimulus for the smell receptors is chemical

¹ W. S. Hunter, *Human Behavior*, p. 245. University of Chicago Press, 1928.

² *Ibid.*, p. 228.

excitation from gaseous particles which are dissolved in the mucus surrounding the cilia on the receptor's surface. The dependence of taste upon smell is probably due to their structural nearness, and to the greater sensitivity of the smell receptors. This relation was investigated by Parker and Stabler, who found the smell receptor about 24,000 times as sensitive as the taste receptor, when they used ethyl alcohol as a stimulus.

There are five qualities of the stimulus for smell, as given by the German scientist Henning (1924): flowery, fruity, spicy or resinous, putrid or foul, and smoky or burnt. There are countless blends of these elementary odors. A receptor may become fatigued for any given odor, following which the reception of other odors is also thrown off-balance temporarily. You have experienced this when a strong odor, perhaps an unpleasant one, failed after a time to "be noticed" in its first strength. This fatiguing of the olfactory nerves has a social significance in that odors which one carries about with him, such as commercial perfume, tobacco, or even body odors, and to which he no longer responds, may be noticeable and offensive to others.

(d) *The cutaneous receptors.* The cutaneous receptors are thought to be free nerve endings and special structures in the surface of, or just below, the skin. Physiologists have localized these nerve endings and seen their different structures, but the difference in function of the types has not been proved conclusively. The skin is sensitive to several types of energy stimulus: temperature, injury, and pressure. Certain areas are more sensitive to one type than others, and it has been assumed from this fact that there is variation of function of the cutaneous end organs. Dallenbach,¹ in an extensive study of temperature spots and end organs, found definite "warm spots" and "cold spots" on the surface of the skin, but failed to correlate these spots with any specialized end organs. He concludes: "Since we found no specialized end organs, but only undifferentiated nerve endings in the serial sections, our results would seem to indicate that the free nerve endings besides functioning in pain also subserve the

¹ K. M. Dallenbach, "The Temperature Spots and End-Organs," *American Journal of Psychology*, Washburn Commemorative Volume, 1927, pp. 402-427.

functions that Von Frey ascribed to Krause's end bulbs and Ruffini's cylinders." ¹

From the standpoint of behavior, the sense of touch exhibits one outstanding difference from the other senses, which Dashiell calls "active touch." It is a reactive aspect of a receptor process. He says:

The process of being stimulated by an environmental force is not one of mere passivity on the part of the organism; it may actively apply its receptors to the stimulating agent, may put them in its way. The cutaneous mode of sensitivity is especially facilitated in this manner. The more mobile and more sensitive areas—lips, tongue, finger tips, toes—are manipulated into advantageous positions, as when the baby explores his rattle box or the schoolboy his hollow tooth or the buyer his merchandise. So well recognized is this active form of receiving stimulations to the skin that such popular words as "feeling" and "touch" may carry either the active or passive signification.²

While all the sense organ receptors exhibit a certain amount of this active component, touch is the sense which permits exploration of surroundings most effectively.

(e) *The kinesthetic receptors.* The receptors for kinesthetic sensitivity are sensory "spindles," specialized muscle fibers and free nerve endings, located in the muscles. Mechanical pressures, states of strain resulting from bodily movement, pains and aches in the muscles and joints, excite these receptors. The impulse is thought to travel to the spinal cord and brain independently of possible simultaneous sensory impulses from the cutaneous receptors. The kinesthetic receptors probably assist in controlling muscular tonus and such muscular activity as walking, running, or even writing. In the old parlor game of "pinning the tail on the donkey," where the subject is blindfolded, there is a simple demonstration of the kinesthetic process. The visual and cutaneous receptors are eliminated, and kinesthetic experience accompanies the player's activity.

Visceral sensitivity is a factor in behavior. Such bodily feelings as those of thirst, hunger, and nausea are carried from nerve-ending

¹ *Ibid.*, p. 427.

² J. F. Dashiell, *op. cit.*, pp. 85-89.

receptors in the viscera to coördination centers. Contraction of the stomach muscles, for instance, stimulates the visceral receptors which carry the impulse to the brain, where muscular responses are set off and we become restless or perhaps make verbal responses such as, "When do we eat?"

B. The Connective Basis of Behavior

(1) *The nervous system and its action.* Coördination of the receptor processes, already discussed, and the effector processes, the motor organ responses, is the function of the nervous system. The anatomy of the nervous system is exceedingly intricate, and we shall attempt to describe it only sufficiently to clarify its specific functions. Understanding of the neuron, synapse, and the sensori-motor or reflex arc, later described, is vital to the concept of more complex nervous function. The reflex arc may be considered as the functional unit of behavior. The countless connections of neural arcs through the different levels of the nervous system make up increasingly complex behavior. It is important for the student to make his own applications regarding actual behavior situations, as the nervous structures and processes are discussed in a necessarily technical way.

Since the sense organs have been discussed already as receptors, they may be omitted in further consideration of the peripheral nervous system, which includes the surface receptors and motor effectors. We shall consider later the autonomic nervous system, which supplies certain internal organs and is closely connected with the structure of the central nervous system, which is made up of the spinal cord and the brain.

(a) *The spinal cord.* The function of the spinal cord is twofold: (1) the direct conversion of sensory impulses into motor impulses, and (2) the transmission of nervous impulses to and from the higher brain centers. To achieve the first function, the spinal cord contains the spinal nerves, thirty-one pairs of sensory and motor nerves, combining efferent and afferent fibers. Behavior involving cutaneous sensitivity and organic and muscular responses is controlled by sensory impulses carried by these nerves. The second

function of the spinal cord, transmission of nerve impulse to and from the brain centers, is made possible by definite nerve pathways from the sensory receptors. Another structure for this function is described by Hunter:

The only further detail we need mention is the location of the pyramidal tracts, crossed and uncrossed, which contain fibers originating from cell-bodies in the pre-Rolandic area of the cerebral cortex. Impulses pass down over these and produce movements of the skeletal muscles. All of these fibers finally cross to the opposite side of the body, so that the left side of the brain is connected with the right side of the body and vice versa.¹

(b) *The medulla.* The medulla oblongata is an extension of the spinal cord, about an inch in length and made up of bundles of nerve fibers connecting the cord with the brain. Its function is (1) further transmission of nerve impulse to and from the brain and cord, and (2) control of adjustments which are not further transmitted to brain centers, such as respiration and circulation.

(c) *The cerebellum.* The cerebellum, sometimes called the "little" or "hinder" brain, comprises two hemispheres located behind the medulla and below the hemispheres of the cerebrum or brain proper. Its function is bodily coördination and the maintenance of muscular tonus or contraction. Sensory impulses are here received from visual, auditory, cutaneous, and muscle and joint receptors, and motor impulses are directed to the muscle and joint effectors.

(d) *The thalamus.* The thalamus is structurally a large mass of special connecting or nerve centers located in the center of the brain. All sensory impulses, with the exception of those from the olfactory receptors (noted previously), must pass through the thalamus on their way to the higher cortical levels. As Hunter points out, "Clinical observations indicate that sensory impulses undergo much elaboration in the thalamus, probably in the way of association with other afferent impulses, so that impulses which reach the central cortex have already become complex and integrated." ²

¹ W. S. Hunter, *op. cit.*, p. 163.

² *Ibid.*, p. 165.

This function of the thalamus is the basis for the belief of many psychologists that here is the control center for much adaptive and emotional behavior.

(e) *The cerebrum.* The cerebrum is the "large brain," the upper and anterior part of the brain structure, consisting of two hemispheres, with a layer or rind of gray matter in which are characteristic convolutions. This layer is called the *cerebral cortex* and is the functionally important part of the cerebrum. In this cortex are the nerve centers controlling and directing by far the greater part of behavior. Probably all behavior which includes language response is directed in this center; this implies definite control of all our "higher mental processes." Physiologists have traced nerve fibers from the sense organs and to motor organs, in localized areas of the cortex. The areas so localized have been given functional names: the visual area, in the occipital lobe; the auditory area, in the temporal lobe; the olfactory area, in the hippocampal lobe; the speech area, along the lateral cerebral fissure; the motor centers in the Rolandic areas; and the association areas in the frontal portion of the cerebrum. This was a convenient, if not accurate, interpretation of physiology.

Phrenologists seized upon the concept of localization of function and nonchalantly added such areas as those of cheerfulness, initiative, combativeness; and said that specialization in any of the areas caused the brain to protrude just there. Their method was to "read the bumps" of the head and thus analyze character. This ridiculous pseudo-science possibly warned the real psychologist of the fallacy of assumption of function without careful experimental evidence. Serious psychologists have never considered that the localized areas function as complete units.

Lashley¹ and others have done some valuable laboratory work which throws serious doubt upon some of the theories of cerebral localization of function. Lashley removed first one section of the cortex and then another (in rats) until he had finally removed every part in some rat or other, and found no permanent loss of ability as

¹ K. S. Lashley, "Mass Action in Cerebral Function," *Science*, vol. 73 (March 6, 1931), pp. 245-254.

should be expected if the localization theory were valid. He formulated a "mass action" theory as a result of his study, holding that the cortex functions as a mass and not in parts. However the cortex works, whether as a whole or as a group of functional interrelated parts, it is safe to assume that it actually is the directive center for most complex behavior, such as thinking, talking, remembering, and all creative activity.

(2) *The neuron* is the structural unit of the nervous system. It is a nerve cell of microscopic diameter and of great variation in length. Each neuron comprises a cell body, dendrites, and an axon.

The function of the neuron is conduction of the nervous impulse. Specialization of this function demands classification of neurons into three types: (1) sensory, (2) connective, and (3) motor. In any single neuron, the dendrites carry the impulse toward the cell body, and the axon carries it away from the cell body toward the dendrites of another neuron.

(3) *The synapse* is the connection point between two neurons. The synapse is not a structure at all, but a functional union, and a highly important concept in the theory of nervous conduction. It is at the synapse that the nerve impulse meets resistance of a sort not clearly understood by neurologists. At any rate, the difference in resistance of the synapses determines the pathway of nerve conduction, and the impulses tend to follow the line of least resistance.

(4) *The reflex arc* is the elemental or simplest conceivable hypothetical neural set-up. It may be pictured as a "pathway" from a sense organ, beginning with a sensory neuron, through a connecting neuron (or many of these), ending in a motor neuron and resulting in the release of activity of a motor or secretory organ. Here again, we have to deal with a functional definition, for most behavior is based upon the receptor-to-effector "pathway" idea, but the number of connections is usually multiplied many times.

(5) *The autonomic system*. As its name suggests, the autonomic nervous system is a "self-adjusting" system. Its structure is of neurons, whose cell bodies make up ganglia (cell masses) just outside the vertebral column and in outlying regions of the trunk cavity. This system is the intermediate control between the central

connective nerve centers and the effectors of internal muscles and glands.

Autonomic function is regulation of the involuntary processes, circulation, digestion, and glandular action. The autonomic system is more primitive in function than the central nervous system. Instinctive behavior and emotional responses are a result of emergency autonomic action. It often happens that this action is far more than adequate to the situation. We "flush with anger" when someone rudely jostles us on the street or in the subway. Our autonomic system has suddenly caused an increase of sugar in the blood, raised our blood pressure, increased the rate of respiration. We are actually prepared to do battle in a social situation where a haughty stare would be an adequate response. It is likely that our early ancestors found the autonomic system even more useful than we do, having had a greater variety of physical and behavior emergencies.

C. Effective Basis of Behavior

(1) *Muscles and muscle action.* Whereas the function of the nerves is conduction, that of the muscles is contraction, toward the end of motility. There are two main classes of muscles: (1) smooth, and (2) striated (sometimes called "striped"). The smooth muscles are those of the viscera and of the walls of the blood vessels. Their contraction is usually slow and necessarily sustained. The striated muscles are attached to the bony framework of the body and concerned with bodily movements, "voluntary" behavior. They exhibit more rapid and less sustained contraction than the smooth muscles.

Hill has made an extensive study of the problems of muscular contraction. He describes the muscle as "essentially a mechanism for transforming chemical into mechanical energy." The phenomenon of heat as a product of muscle action is especially interesting. Hill writes:

Immediately on stimulation there is a large and rapid evolution of heat; this, in contraction of short duration, represents about half the "initial" energy: it is complete long before the moment when the max-

imum tension is attained; then follows relaxation, accompanied by the other half of the "initial" heat. In a prolonged contraction there is another equally obvious phase, that associated with a constant rate of heat-production, lasting as long as the contraction is maintained.¹

A complex chemico-physical process is carried out in muscle action. It is sufficient for present purposes to understand that muscle action is the effective basis of behavior through functional contractions.

(2) *The glands and their actions.* The glands of the body are cell structures which secrete different substances according to their functional specialty. The sweat glands, tear glands, and digestive glands are examples of these regulating mechanisms. These structures secrete their fluids through ducts to the body surface or into the alimentary canal. There is another type of gland which largely regulates behavior, called the ductless or endocrine gland. These glands pour their secretions into the blood stream or act directly by chemical action upon bodily tissue.

The endocrine glands are active in emotional behavior, as will be seen in the later chapter on emotion. Their function in emergency behavior is closely related with the action of the autonomic nervous system, already discussed.

There is much literature on the endocrine glands. Many of the theories enthusiastically exploited a decade or more ago in relation to the properties and functions of these glands have since been tempered by medical and scientific investigation. It is certain that the endocrine glands do play a large part in certain types of development and behavior. Abnormal behavior has frequently enough been associated with "endocrine imbalance"—that is, inadequate or overadequate action of one or another gland, in relation to the other endocrine glands.

Little is known of the function of some of the ductless glands. Their structure is well known to the physiologist, and experimental work is determining certain functions. (1) *The suprarenal gland* is

¹A. V. Hill, "The Laws of Muscular Motion," *Proceedings of the Royal Society (B)*, vol. 100 (1926), pp. 87-108.

located above the kidneys and secretes adrenin. Cannon¹ has contributed the results of some fine research on the action of adrenin, in his work on the emotions. Briefly, some effects of increased adrenin secretion are: tension of voluntary muscles; relaxation of smooth muscles; rushing of blood to body surfaces and vital centers; expedition of blood-clotting; and release of available sugar (glycogen) from the liver into the blood stream, accelerating muscular work.

(2) *The pituitary gland*, located at the base of the brain, is thought to secrete one hormone (a term applied to all endocrine secretions) affecting bodily growth, and another similar to adrenin in its effect upon behavior.

(3) *The thyroid gland*, because of its greater operative accessibility, is much better understood, at least as to structure, than the other ductless glands. This gland, made up of two lobes, one on each side of the trachea, secretes thyroxin, and is supposed to influence much emotional response. Cannon describes the physiological effects of thyroid action on basal metabolism, fat and protein storage, calcium regulation, and temperature control.

Overactivity of the thyroid gland, marked by a structural disturbance known as goiter, produces characteristic emotional instability. Underactivity of the thyroid is productive of inadequate emotional responses.²

Iodine is an ingredient of thyroxin, an active principle of the thyroid hormone. The iodine must come from the body's food supply, and a diet providing insufficient iodine seriously unbalances thyroid action. Murphy discusses this feature of the thyroid gland:

The failure to take in enough iodine in the food puts a strain on the thyroid, and the gland sometimes enlarges in such a way as to form one of the many kinds of goiter. This is common, especially among women, in those parts of the world in which the water is deficient in iodine, for example in the southern Alps and around the Great Lakes in the

¹ W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage* (Second Edition). Appleton-Century, 1929.

² W. B. Cannon, *The Wisdom of the Body*. Norton, 1932.

United States. Some cities now put a small quantity of iodine in the water supply.¹

Cretinism is a term applied to an abnormality concerned with deficient thyroid action. Of it, Murphy says:

Among the more extreme physical manifestations of thyroid defect we find the "cretins" who, if not cared for medically, do not grow mentally beyond the level of an average child of four or five years.

The influence of the thyroid upon the emotional make-up is equally striking. Cretins are usually slow, unexcitable, torpid. Among otherwise normal adults in whom the thyroid has for some reason ceased to do its work adequately, the same lack of energy often appears. On the other hand, too much thyroid secretion is often attended by agitation, excitement, apprehensiveness—a state directly opposed to that appearing when the thyroid is underactive.²

(4) *The gonads* are the sex glands, secreting the interstitial hormone, and controlling the development of secondary sex characteristics and later variations in sex behavior. The hormone is secreted by specialized tissues within or immediately near the sex glands themselves, the ovary in the female and the glands in the testicle in the male.

Secondary sex characteristics are the physical developments first conspicuous at puberty, which distinguish the male from the female. They include hair-growth on the body, change of voice—especially noticeable in the adolescent boy—and body-contour differences.

DETERMINANTS OF BEHAVIOR: II. GENERAL PHYSIOLOGICAL AND FUNCTIONAL PRINCIPLES

A. Introduction

In the preceding section we discussed some of the structural units of the human body and their specific functions. In this section we shall attempt to clarify somewhat the general principles in accordance with which human behavior, as an organismic and integrative phenomenon, proceeds.

¹ Gardner Murphy, *A Briefer General Psychology*, p. 60. Harper, 1935.

² *Ibid.*, p. 60.

The sensori-motor processes vary in complexity all the way up from the simple nerve-muscle preparation to highly coördinated social behavior. Weiss says:

Every action that an individual performs is the result of sensori-motor processes. Of these there are three types: sensory, nervous, and motor processes. Whether the action is that of withdrawing the finger from the hot stove or the myriad of movements which are involved in the recording of a finished sonata, physiology can detect only sensori-motor processes as the direct antecedents of these movements.¹

For convenience we shall classify the general principles involving correlation of the nervous processes and human behavior as physiological and functional. It should be borne in mind that the generalizations to follow are hypothetical. Psychology has to rely upon measurement of stimulating conditions and observable muscle contractions. What takes place between these phenomena is largely a matter of theory.

B. Physiological Principles

(1) *The nervous impulse.* The passage of the nervous impulse is best characterized as a "disturbance" type of functional response. The sensory neuron is stimulated by the different classes of stimuli discussed in the section on receptors. Energy for the transmission of the impulse is supplied, as in muscle function, by metabolism; in the nerve fiber itself metabolism takes place and energy is propagated by changes in electric potential.

Warren and Carmichael liken transmission of the impulse to the movement of the point of flame as a gunpowder fuse burns. They carry the analogy further, saying:

Like the propagated point of combustion in a fuse, the nerve impulse, as it passes over a neuron, gives off both carbon dioxide and heat. This progress is also accompanied by electrical changes in the nerve. The point of excitation becomes electrically negative in respect to the unex-

¹ A. P. Weiss, *A Theoretical Basis of Human Behavior*, pp. 181-183. Columbus, Ohio: R. G. Adams and Company, 1929.

cited portions of the neuron. When a gunpowder fuse has been burned out, it cannot be re-ignited until it has been provided with fresh gunpowder.¹

Nervous energy is not a steady, continuous flow. Reaction time for reflex acts has been measured and found much greater than would be expected if nerve conduction were spontaneous and direct. It is inferred that the difference in time measurement is due to overcoming inertia in both the receptors and effectors, and to delays in the connective system.

(2) *Neural resistance*. Changes in resistance to neural transmission may be considered from the standpoint of the response threshold or limen. This threshold is the minimum intensity of stimulation required to set off the response. With repetition the threshold may be lowered—that is, a weaker stimulus will set off the same response. This may be due to strengthening of synaptic connections.

Lund presents the newer theory of polarization as accounting for resistance. He writes:

Resistance changes attending learning and practice are closely linked with the fact of neuron *polarization*. That neurons are polarized or become polarized during excitation and transmission is evident in the fact that nerve currents will pass only in one direction across a synapse—from axone to dendrite. This is in agreement with the disposition of ions or electrical particles to pass only in one direction when polarized bodies are brought into contact. Apparently the effect of nerve excitation and conduction is to dissociate the ions and to provide for their passage from axone to dendrite. Recently there has been a tendency on the part of some authors to refer to the changes attending learning and practice to polarization effects rather than to changes in specific synaptic connections.²

Lund mentions the influence of certain drugs upon resistance changes in the nervous system. Resistance is increased, the threshold raised, by administration of ether or chloroform, to the point

¹ Howard Warren and Leonard Carmichael, *Elements of Human Psychology*, p. 42. Houghton Mifflin, 1930.

² F. H. Lund, *Psychology, an Empirical Study of Behavior*, pp. 116–117. Ronald Press, 1933.

of anesthesia. Alcohol has about the same effect, although the change is slower. Strychnine and caffeine have the opposite effect, lowering the threshold and decreasing resistance. Hollingworth reports that the work of a typist increased both in quality and quantity under the influence of two to six grains of caffeine.

(3) *The "all-or-none" law.* The functional response of the nerves and also of striated muscles or tissue is determined by the all-or-none law. As stated by Forbes,¹ "the release of energy (propagated disturbance) evoked by a single stimulus in a single functional unit of nerve or muscle is always as large as that functional unit is capable of producing at the moment when the response is evoked, no matter how strong the stimulus may be." In short, any adequate stimulus calls forth the maximal intensity of impulse for a single neuron.

(4) *Tonus.* The persistent partial contraction of muscles is called tonus. The mechanism of tonicity is complex and the exact nerve centers involved are not known. It is supposed that the autonomic system may act to innervate the skeletal musculature, as does the central nervous system. Posture of the body is maintained partly by stimuli of the middle ear and various muscle receptors.

C. Functional Principles

(1) *Reaction hypothesis.* At the beginning of our discussion of the determinants of behavior we pointed out a fundamental principle: there is no response without stimulation. There is no such thing as spontaneous human activity. Stimuli need not be environmental; they may be internal or organic, but they are the necessary origin of any reaction.

(2) *Summation.* It is thought that action of a nerve may result from a series of independently inadequate stimuli. This is known as the principle of summation and has been observed in the simple nerve-muscle preparation and assumed in the reflex arc set-up.

¹ Alexander Forbes, "The Mechanism of Reaction," in Carl Murchison (Editor), *The Foundations of Experimental Psychology*, p. 142. Clark University Press, 1929.

Adrian and Lucas ¹ explain summation in nerve-muscle preparations as due to fatigue in the neuromuscular junction. Where the junction was sufficiently fatigued, muscle contraction was not achieved by the first nervous impulse, but followed a succeeding stimulation applied during the supernormal phase, following the refractory period.

The phenomenon of summation in discrete nerves has a peculiar analogy in gross behavior in the securing of a response by a repetitive series of inadequate stimuli. For example, Willie is playing baseball in the vacant lot. His mother calls, "Willie!" at one-minute intervals for five or six minutes before Willie answers and starts homeward. He has heard each call, and providing mother's voice has not become increasingly urgent, we may say his response was due to a summation of stimuli. However, the student should be cautioned against the assumption that neural summation is directly causative of cumulative gross behavior. Rather, the same term has been used more or less carelessly to describe vaguely similar processes.

(3) *Facilitation*. As in the use of the term "summation," there seems to be a divergence of authoritative usage of the descriptive term, "facilitation." We have on the one hand the hypothesis of facilitation as neural explanation, and on the other hand, as a phenomenon of gross behavior. A more accurate term for the neural hypothesis is probably "reënforcement." Sherrington ² explains reënforcement of the activity of one reflex arc through stimulation of an allied arc by his theory of variability of the "reflex threshold." Experiment has shown the threshold of the reflex to be many times more variable than that of the single nerve.

Warren and Carmichael ³ suggest that reënforcement is due to simultaneity of impulses falling within the supernormal periods for excitement.

In learning, facilitation is described as the effect wherein less time

¹ E. K. Adrian and K. Lucas, "On the Summation of Propagated Disturbances in Nerve and Muscle," *Journal of Physiology*, vol. 44 (March, 1912), pp. 68-124.

² C. S. Sherrington, *op. cit.*, p. 37.

³ Howard Warren and Leonard Carmichael, *op. cit.*, p. 42.

is necessary for performing an act, as a result of strengthening of the acquired pathway.

(4) *Inhibition*. Whereas the foregoing discussion presented theories of strengthening or reënforcing the effects of nervous action, we shall now review the hypotheses of interference, or blocking of activity. "Inhibition" is a generic term for reflex phenomena, which is descriptive of behavior and useful in the explanation of personality.

(a) *Reflex inhibition*. Where two incipient responses interfere with each other, one of several behavior resultants may ensue. One response may predominate at the expense of the other, but with lessened intensity; both responses may occur, but with lessened intensity; or both responses may be completely prevented.

Warren and Carmichael¹ explain inhibition as the result of simultaneous passage of impulses over different "loop systems" (reflex chains, elsewhere described), wherein "one series of impulses falls in the refractory phase of another."

(b) *Mutual inhibition*. Where the opposing stimuli are so evenly balanced that alternative potential responses are eliminated, we say there is mutual inhibition. This is a common enough behavior situation. We wish to make a telephone call, and we wish to look upon a study reference. The balance between the two stimuli is so even that we postpone both responses and finally do not achieve either of them. A proverbial example of mutual inhibition is that of the donkey that starved to death standing between two bales of hay. The balance between the stimulus to turn to the right and the opposing stimulus to turn to the left was perfect, and the result was starvation.

(c) *Retroactive inhibition*. An interesting phenomenon in the field of learning—or, more specifically, in forgetting—is that of retroactive inhibition. The term describes partial loss of retention through the interference of other activity that has been interpolated between two or more practice periods. The recall of the earlier activity is impaired or even lost. The loss is greater than ordinary forgetting would cause. You have possibly prepared a lesson, let

¹ Howard Warren and Leonard Carmichael, *op. cit.*, p. 42.

us say a reading of history, and in immediate review consider yourself "letter-perfect." At some time between your preparation and recitation times, you read a newspaper, study your psychology text, or even balance your checkbook. When history class time arrives you are surprised to find that your recall of the lesson is far from perfect. The earlier responses seem to be "gone with the wind." What has really happened in such a case is interference with the first learning by the intervening activities. When the materials of intervening activities are somewhat similar to the activity to be recalled, there is greater interference. We say there are "conflicting associations."

It has been found by experiments that the best retention is secured when rest or sleep intervenes between learning and recall. This is an important hint for college students who wish to make their study habits more efficient.

(5) *Fatigue*. In connection with specific nerve and muscle preparations we have already viewed fatigue as a functional determinant. The reflex arc also exhibits fatigue, and to a more pronounced degree than the fibers of the nerve trunk. Sherrington¹ gives evidence to demonstrate that fatigue in the reflex arc takes place on the nerve pathways to the motor center, not in the motor neurons themselves. He ascribes practically all the functional properties of the reflex arc to synaptic control.²

Nervous fatigue and muscular fatigue are often confused in interpreting our own behavior. The nerves are relatively indefatigable. When one nerve muscle or action system becomes fatigued, we can obtain relief by changing to some activity which uses another system.

General fatigue, developed after prolonged strenuous work, probably results from the toxic effect of waste products from metabolism, accumulated in the circulatory system.

TYPES OF BEHAVIOR

(1) *Instinctive behavior*. At one time, much human behavior was interpreted by use of the term "instinct." An instinct was thought

¹ C. S. Sherrington, *op. cit.*, p. 218.

² *Ibid.*, p. 16.

to be a form of unlearned behavior, but the term was loosely applied to any tendency of the organism to react in a definite way, where the stimulus was not observed or understood. Writers on the subject had long categories of instincts, including even such complex behavior patterns as "collecting," "play," and "sociability."

An instinct is a form of response unmodified by experience or occurring without practice. It involves relatively simple responses, but can be a pattern of behavior and well integrated. Its appearance in behavior is determined by the growth of the nervous system.

Watson,¹ as the result of his study of instincts in infants less than one year of age, conceded only three emotionalized instincts: fear, love, and rage. More recently the existence of any instinctive behavior in fear has been questioned. Watson described fear responses to the stimuli of sudden removal of support and sudden loud sounds.

Hunter points out the permanent character of instincts when he says:

There is no clear evidence that instincts in man and the higher animals are "intrinsically transitory"; not all instincts are present at birth. Breathing, sucking, swallowing, fear (possibly), and others are, it is true; many appear later, with the sex and parental instincts coming last. Once these forms of behavior have appeared, however, once the nerve centers which control them have matured, there is no good reason to believe that the organism ever loses them.²

The delayed instincts active in sexual behavior appear to be dependent upon certain phenomena of maturation. Lashley writes:

The most probable explanation of the delayed sexual reactions thus seems to lie in the special sensitivity of a definite neural system, previously organized by growth, to a specific chemical circulating in the blood. Of course, there are many complicating factors. The male tern reacts at once to an egg in his nest, the female only after she herself has laid an egg; the feminized male rat will respond to young, the female only after she herself has borne a litter. The effectiveness of the hormones is

¹ J. B. and R. R. Watson, "Studies in Infant Psychology," *Scientific Monthly*, vol. 13 (December, 1921), pp. 493-515.

² W. S. Hunter, *op. cit.*, p. 190.

modified by many factors. Habits soon come to play a rôle and obscure the congenital integrations.¹

(2) *Learned behavior.* In contrast to instinct, response without practice, we have habit, which implies response resulting from practice or experience. Habit provides the method by which the organism adjusts itself with greater mental economy, developing better, more direct reactions to stimuli, eliminating ineffective responses.

Although habits become as fixed as instincts, they grow out of individual experience rather than inherited nature. Habit information is synonymous with the learning process. Watson² defines habit as "a complex system of reflexes which functions in a serial order when the child or adult is confronted by the appropriate stimulus, provided we add the statement that in habit the pattern and order are acquired, whereas in instinct they are inherited." And Dashiell³ says: "A habit is *not an ironclad fixed and immutable pattern of activity* but is a *mode of adjustment capable of some modification* to fit circumstances; it is, within limits, variable."

In behavior, both individual and social "habits" are the basis of predictability and any possibility of ensuing control. Dashiell discusses the "all-pervasiveness of learning" when he says:

Consider, for instance, the ubiquitous character of "habits." In common speech this term is used with primary reference to *overt* learned performances. Of such are throwing, dancing, handwriting, typewriting, speaking, singing, manners of eating, listening to music, and so on. The more technical uses of the word apply it also to implicit (internal, covert) forms of learned performances. There are the various employments of *silent speech* in "mental arithmetic," reading to one's self, telling one's self what one does not care to speak aloud. We shall have occasion to note the formation of habitual *emotional* reactions: a child's fear of "bugs" or of the dark, one man's love for his work, another's extreme

¹ K. S. Lashley, "Nervous Mechanisms in Learning," in Carl Murchison (Editor), *The Foundations of Experimental Psychology*, p. 529. Clark University Press, 1929.

² J. B. Watson, *Psychology from the Standpoint of a Behaviorist*, p. 291. Lippincott, 1919.

³ J. F. Dashiell, *op. cit.*, p. 368.

self-esteem, still another's super-patriotism. Again, we shall note the organizing of habitual ways of *attending* as well as of *perceiving*: how one man notices the street-car advertisements while the other studies his fellow-man; how a husband may appraise analytically the wines served at a dinner while his wife makes appraisals equally critical of the gowns worn by guests. Still more general habits are the *attitudes* that reveal themselves in the man who shows consistent prejudices against those of alien races or who can be counted upon to explode whenever he hears mention of "communists," or who is for his town or his profession right or wrong. Habits then are of all sorts.¹

Guthrie has studied habit formation as "stereotyped response." He points out the importance of including movement or action in a consideration of the conditioned response. According to Guthrie,² "a combination of stimuli which has accompanied a movement will on its recurrence tend to be followed by that movement."

SUMMARY

1. The organization of the central nervous system—receptors, connectors, and effectors—forms the somatic or structural basis of behavior; this system interacts with the autonomic nervous system and the muscles and glands of the body.

2. Structure and function are separate considerations only to the technical student. In psychology, the relation is very close and we are interested in structure only as it helps us understand function.

3. The physiological principles of nervous impulse, resistance, the "all-or-none" law, and muscular tonus are of basic importance in understanding and predicting behavior responses. Functional principles, such as the reaction hypothesis, summation, facilitation, inhibition, and fatigue, are of still greater value, possibly, as they explain and describe phenomena of gross behavior, which we recognize at once.

4. The types of behavior discussed as instinctive and learned are usually not found in isolated acts, but must be considered as inter-related and integrated in most behavior study.

¹ *Ibid.*, p. 363.

² E. R. Guthrie, *The Psychology of Learning*, p. 26. Harper, 1935.

QUESTIONS

1. Which do you consider more important from the standpoint of behavior, structure or function of the body?
2. What difference in adjustment is effected by congenital blindness?
3. Describe the structure and function of the neuron, the synapse, and the reflex arc.
4. Discuss the theory of "cortical localization." What is the present status of this theory?
5. Why do you think many people prefer such an explanation as that of phrenology to a scientific explanation of behavior?
6. What are the endocrine glands? Describe the function of the better known ones.
7. Restate as simply as possible the "all-or-none" law of nerve conduction.
8. Take any one of the functional principles listed in the chapter and give examples from your own observation to illustrate it.
9. What is a habit? How does it differ from "instinctive behavior"?

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II. UNDERSTANDING OURSELVES

CHAPTER IV

PERSONALITY

DEFINITION OF PERSONALITY

Personality is not easy to define. Examination of writings upon the subject soon discloses that.¹ Some of the definitions offered by psychologists are confusing because they attempt to be absolutely objective and specific. Such definitions have a tendency to run to tremendous detail, and although possessing the merit of being stated in units which are universally understood, they lack practical applicability. They are like attempts at complete description of the performance of tying one's necktie. To be strictly accurate in defining the performance of tying a necktie, one should name all the muscles and muscle groups involved and state each detail of performance. The absurdity is patent. Yet some psychologists try to do exactly this when they insist that a scientific description of human conduct must always be given in the most objective units possible. On the other hand, with equal if not greater frequency, personality has been defined in unduly metaphysical, mystical, and poetic terms. Such metaphysical definitions are valueless because we are left with nothing tangible. Inasmuch as the present discussion has as its thesis that the individual may partially control his personality, and inasmuch as this discussion will attempt to make clear how such control may be exercised, the definition of personality in vague, nebulous terms is highly unsatisfactory from our point of view.

Another point that bears directly upon any effort to define the

¹ S. C. and K. C. Garrison, *Fundamentals of Psychology in Secondary Education*, pp. 562-578, Prentice-Hall, 1936; J. H. Griffiths, *Psychology of Human Behavior*, Part VI, Farrar and Rinehart, 1935; Gardner Murphy, *A Briefer General Psychology*, pp. 443-473, Harper, 1935; C. E. Skinner (Editor), *Educational Psychology*, pp. 250-272, Prentice-Hall, 1936; Daniel Starch, Hazel M.

nature of personality is whether the definition should be solely in terms of traits (whether they be physical, physiological, or attitudinal), or whether it should include the reactions of others. Boynton,¹ in an able discussion of the psychology of personality, has emphasized the fact that personality must involve the reactions of others. This is a point of which our definition will take definite cognizance. Boynton, however, goes on to say that expressions such as "fine personality," if not actually meaningless, are definitely misleading and without basis in fact. To this it may be replied that although, unquestionably, a "fine personality" cannot be defined in terms of set traits unless one wishes arbitrarily to say that such and such a list comprises a fine personality and let it go at that, the reactions of others are social facts, and if one is willing to accept these reactions as the criteria of fineness, pleasingness, strength, and the like, then phrases such as "a fine personality" are both meaningful and objective. These ratings of fineness, pleasingness, or strength may change with times and places. But such expressions *when defined in terms of the group* are timesavers in exactly the sense that saying, "He tied his necktie," is a timesaver. It is meaningful language even though it is not exact.

Since our treatment of personality is intended to be practical, it will be impossible to avoid discussing, in considering personality, what constitutes a "good" and what constitutes a "bad" personality as judged by others. Certain groups of traits and types of conduct may, in similar individuals, tend to produce the same social response, but this certainly is not true to the extent of enabling one to compile absolutely final lists of "good" and "bad" personality traits.

Before finally essaying a definition of personality, let it be said that the following assumptions are hereby admitted:

1. That any definition is given principally for the purpose of consistency in discussion and not for the purpose of criticizing some other definition.

Stanton, and Wilhelmine Koerth, *Controlling Human Behavior*, pp. 327-347, Macmillan, 1936.

¹ C. E. Skinner, *op. cit.*, pp. 250 ff.

2. That any definition of personality should be in as objective units as is practically possible, preferably in terms of behavior or conduct.

3. That personality implies interaction between the individual and his social environment. This is emphasized in our treatment, although Gault,¹ a noted authority, minimizes it.

4. That the whole individual is involved in personality reactions, although parts of either one's physical being or functioning may emerge at times as predominating elements, traits, or characteristics.

5. Personality implies the reactions of others to our own traits and actions.

6. Personality is a relative term, and no final list of actions or physical attributes can be compiled which will ever be found to be reliably correlated with any personality trait.

7. Personality involves not only the reactions of others to one's own physical traits or conduct but involves, also, emotionalization of these reactions as attitudes.

We are now ready to define personality for the purposes of our own discussion. *Personality is that portion of the totality of an individual's conduct to which others respond by emotionalized evaluation or the evaluation itself.* A few comments are necessary. We said in our list of assumptions that the definition of personality implied totality of reaction. Generally speaking, this is correct. However, the totality of one's reactions includes much inner or covert conduct. Sometimes this cannot be reacted to by others. Therefore, strictly speaking, it is not the sum total of our conduct to which others react. Others do not usually respond, for example, to the digestion of our food, although it is behavior, unless such digestion goes awry to the extent of affecting our external conduct, which may in turn affect the attitude of others toward us. Another comment is called for by the term "emotionalized." Some authors do not include this qualification. Two men on the opposite ends of a crosscut saw, engaged in the business of sawing a log in two, may not be reacting to each other's personality at all, or at least very little, although they may

¹ R. H. Gault, *Criminology*, p. 38. Heath, 1932.

be reacting continuously and to the totality of each other's muscular reactions on a non-emotionalized and non-evaluating basis. For purposes of our discussion, personality includes not only the emotionalized reaction but the evaluating one as well. The evaluation may be in terms of goodness or badness, interestingness or uninterestingness, or any one of numerous other criteria. There is, however, nothing either intrinsic or absolute about such a trait as "interesting"; different persons may be interesting for very different reasons.

Students should not be unduly concerned by the slightly confusing problem of whether the personality is residual in the conduct of the person whose personality is being judged, or in the emotional organization of the one who is observing it. *Interaction* is the thing that is important. What we have, of course, is not conduct manifestations by one person which are judged by his fellows, after which the whole incident is closed as a compartmentalized unit of social behavior. Instead, there is a continual interaction involving both the physical traits and conduct of the individual and the reactions of society to them. If one is getting from others the reaction which he desires, his tendency is to pay comparatively little attention to what is producing this favorable reaction. This is natural and understandable. But if the evaluations of my fellow men of the totality of my appearance and conduct are adverse, then I begin to scrutinize myself, both structurally and functionally, to determine and alter the state of affairs until it becomes more to my liking. Thus, we see that one other factor has been added to our equation; namely, the factor of our own evaluation of reactions of others to us, and, therefore, indirectly our own reactions to ourselves. *From now on, we shall take personality to imply either the reactions of others towards ourselves or our own conduct producing the reaction.*

PERSONALITY AND SUCCESS

There is only one type of success which our discussion in this section will not include. One who is studying to be a successful hermit need worry comparatively little about personality as we

have defined it. In all other cases, no matter how success is defined, personality adjustment is a cogent factor in attaining it.

Suppose a man's goal is success in business. In this medium, he will encounter other people every day. He will strive to influence their actions favorably. He will try to get his employer to react positively instead of negatively to a request for a promotion or an increase in salary. The type of reaction will be dependent upon the totality of the impression which he gives. If the results at first are not satisfactory, he will study himself and rearrange some details of appearance or conduct to alter the totality of the situation.

The question arises as to whether or not there are some kinds of behavior which always lead to positive suggestibility in others. Is a smile, for example, always reacted to favorably by everyone, and therefore is it stock-in-trade for the person who wants to cultivate what we term a pleasing personality? Reading the mottoes on the desks of most sales managers inclines one strongly to the belief that a smile is not only received favorably but is a panacea in practically every situation where trouble is likely to occur.

Psychologists have never been agreed as to just how many things are "naturally" satisfying to human beings. However, it is not necessary to solve the puzzling question of native satisfiers and annoyers to make material progress in the direction of obtaining our objectives in personality development. To this end, analysis of social attitudes at a given time and place is of practical value. Donald Laird made a commendable effort to determine differences in personality interactions in different professions. He came to the conclusion that substantial if not marked differences exist in the conduct which produces positive and favorable responses in various professions. The traveling salesman's jokes are not generally told to the clergy; a physician, although very capable, would be viewed askance if he hawked his wares as a corner peddler. The fact that these attitudes and responses are learned, and are in some cases highly artificial from the social standpoint, does not modify the practical problem at all. The practical problem in obtaining any personality objective is so to modify our phase of the personality

interactions, since this is the phase over which we have maximum control, as to make the total interaction conform to a social criterion.

THE BASIS OF PERSONALITY

If practical psychology has any one thesis which can summarize its entire effort, that thesis might well be stated as follows: we are all born with rather effective structural equipment for living. That equipment, consisting of protoplasm appearing in various guises, is capable of tremendous adaptation and modification. The modification begins before birth and lasts until death. Some of this modification takes place automatically as in vegetative growth. Some of it, and with this we are primarily concerned, is the result of contact with a controlled environment. The basis of all conduct, then, is a modifiable organism equipped with general "drives to action."

The same principle of conduct holds for personality. It would be fantastic to say that there is no definite structural and functional basis of personality. It is almost equally fantastic to maintain that this basis is some nebulous, instinctive endowment. Personality, of course, depends upon both structure and function, but these operate in no other way than in ordinary learning. In fact, to no small extent personality is a product of learning. Thus, students of striking world personalities, such as Roosevelt, Hitler, and Mussolini, invariably maintain that the appeal of these men lies partly in natural magnetism but largely in an effective series of acquired habits. Careful study of the early lives of such men reveals that all of them have tried various conduct patterns and discarded ineffective ones. The successful actress or motion picture personality does not always relish the personal appearance and habits which must be maintained, but experience has shown that certain criteria must be met to be that particular kind of personality.

PERSONALITY FACTORS BEYOND OUR CONTROL

In this section we shall consider those personality factors which are beyond our control; and in the next section, those which are

within our control. In some cases, the distinction is rather arbitrary. Certain factors might well be in both lists.

(1) *Hereditary predispositions*. One problem which has long puzzled psychologists is that of prepotent tendencies, as described by Allport.¹ Some psychologists make much of instinct, a powerful and native driving force over which the individual animal has little or no control. Psychiatrists sometimes say that man is the victim of his own glands. The same notion is implied.

(2) *Community customs*. Communities have standardized ways of reacting. They are called mores. These might almost be regarded as community predispositions that are analogous to the biological predispositions of individuals. For as an individual is foreordained to exhibit certain kinds of conduct under certain conditions, so also social heredity dictates certain group responses and social behavior. Individuals are seldom able, within a relatively short period, to alter these mores, but must adjust to them.

(3) *Early training*. Criminal lawyers sometimes maintain, with considerable show of plausibility, that the child is the victim of his own early training, and that criminality is beyond voluntary control. Consequently, an individual's personality set comes under the same category, for many of the habit patterns which result in later definitely emotionalized reactions toward ourselves are formed in an environment over which we have relatively little control.

(4) *Morphology*. Loosely speaking, morphology is gross anatomy. To the extent that this is a factor in determining the reactions of others toward ourselves, it is largely beyond our control. We shall see presently that appearance, which involves a certain rearrangement of natural morphological endowment, is listed among the factors within our control. But whether we are tall or short, fat or thin, black or white, is generally beyond our control.

One example of the effect of morphology upon personality is illustrated by the common belief that short men are inclined to be pompous. Napoleon is cited as a classic example. Those who believe this contend that a grandiose manner is a compensation for small size. It would certainly be a gratuitous violation of scientific

¹ F. H. Allport, *Social Psychology*. Houghton Mifflin, 1924.

principles to subscribe to any such notion categorically. On the other hand, who has not known the belligerent type of little man? In the case of such a person, we can trace an easily discernible cycle in which the size of the individual, his reaction to his own size, and the reaction of others to both his size and his own reaction to it, are factors affecting personality.

PERSONALITY FACTORS WITHIN OUR CONTROL

(1) *Appearance*. Clothes make the man, goes the saying, and the business world believes it. Students of fashion, a much neglected phase of psychological investigation, maintain that clothes affect not only the reactions of others but one's own morale as well. British army officers stationed in far-flung outposts are said to dress meticulously every night for dinner—a concession, undoubtedly, to the same idea.

When one attempts to analyze just what features of appearance are most likely to influence others, the problem becomes a little complex. With women, adherence to the fashion of the minute is unquestionably a factor of some moment. With men, personnel research studies on the subject indicate that cleanliness and neatness are the two factors weighted most heavily.

(2) *Language*. Language is man's outstanding medium of expression. It symbolizes, externally, internal conduct and conduct patterns. It is of primary importance as a factor within our control, and through the process of suggestion we influence the attitude of others toward us.

(3) *Consistency of conduct*. Practically every definition of insanity, as well as definitions of instability of personality, gives inconsistency as an identifying trait. We should, therefore, expect consistency of conduct to be regarded favorably by others. Furthermore, consistency of conduct is partially within our own control and is the result of habit-forming activities, although, as we have already pointed out, consistent conduct is influenced by our early training.

(4) *Manners and morals*. In many ways, manners and conformity to social mores are superficial; hair-splitting niceties of etiquette sometimes seem almost silly. Much attention, however,

is paid to social etiquette and decorum by many people who are quick to pass an adverse judgment on the personality of the non-conformist. Americans, in the past, have prided themselves on an easy-going lack of formality. As the ease of civilization increases, however, more emphasis is placed on manners as an evidence of pleasing personality. In fact, many persons who are not particularly gifted or bright secure for themselves a solid position in community esteem because of their smooth social adaptations.

INFLUENCING ANOTHER'S PERSONALITY

Practically everyone knows someone whose personality is not so good as it could be and whom he is interested in helping. Suppose one undertakes to assist such a person in ordering his personality. How should one go about it? It is not an easy task, as anyone who has tried it will readily grant. Even those who are aware that their personalities are both antagonizing and uninteresting do not accept criticisms gratefully. Yet the task is of such vital significance that one often feels obliged to undertake it.¹

The whole secret of influencing other people, including the problem of trying to get them to alter their own personalities, is that the best results are secured by indirection. The many books which have been written on this topic agree upon this point. Different authors suggest different devices and expedients for the indirect approach, but all are agreed that, in dealing with the majority of people, the direct frontal attack is not to be preferred. True, there is a rare, intelligent, self-critical, and objective-minded minority who value and appreciate friendly and honest suggestions even when straightforward and blunt. For every person of this sort, however, there are dozens who must have twice as much sugar in the pill as there is medicine. One often wonders how far his self-respect will allow him to carry the principle of indirection even when he recognizes it as psychologically

¹ Before beginning our own discussion, mention should be made of the fact that some excellent books have been written on this subject. Among the best are: Dale Carnegie, *How to Win Friends and Influence People*, Simon and Schuster, 1937; E. T. Webb and J. B. Morgan, *Strategy in Handling People*, Garden City Publishing Company, 1930; and Wendell White, *The Psychology of Dealing with People*, Macmillan, 1936.

valid. For example, some of the suggestions advanced seriously by Dale Carnegie smack strongly of both deceit and sycophancy.¹ Carnegie undoubtedly knows his people, and the sale of his book speaks for itself; but he advises many questionable tricks such as a grown man's crawling behind his mother's skirts for protection. Perhaps it might be well to point out that with most of us there comes a time when we cease to care whether the other fellow loves us or not!

Starting then with our general principle of indirection, we pass now to a consideration of certain specific ways by which we may induce others to alter their personalities.

(1) *Interest in other people.* If you are attempting to get someone else to change his habits or appearance, it is well to be, or at least seem to be, genuinely interested. Most persons are willing recipients of reasonably tactful suggestions if they believe that the suggestions are offered by someone who really enjoys helping others. Carping criticism is not usually well received.

(2) *Recognizing the work of others.* When another's personality grates on our own, there usually follows what Thorndike calls the "halo" effect from the particular personality traits which are offensive to the person's total behavior. We then show a tendency to regard him as totally offensive. If one schools himself against this tendency and recognizes the worthy points of others, he puts himself in an advantageous position for making suggestions.

(3) *Commendation preceding criticism.* Everyone reacts unfavorably to constant nagging. The best antidote to the negative reaction is almost invariable commendation preceding criticism. This commendation need not and should not be insincere. One whose personality is so totally objectionable that there is no factor in it which can be picked out for commendation ought not to be used as the subject at all.

(4) *A chance for ego-preservation.* All of us value our egos, even though we may not think so and may not admit it. Suggestions which would otherwise be resisted are willingly received if the individual whose personality requires readjustment is allowed to

¹ Dale Carnegie, *op. cit.*, p. 229.

"save his face." A number of inferences can be drawn from this. One is that seldom should adverse comments on another's personality be made in the presence of other persons. It is especially difficult to save face under these circumstances.

(5) *Pseudo self-discovery*. This is indirection at its very best. He is the personality manipulator *par excellence* who can get the other fellow to think he is discovering his own faults and the means of correcting them. One practical and effective way of doing it is a conversation about a third party whose faults are related, but not too closely, to those of the person whom one is trying to lead to a self-view.

(6) *Humor*. "The Virginian," to take an example from literature, was willing to accept an imputation of canine ancestry provided the suggestion was accompanied by a smile. Many of us today feel the same way. The process of social induction, which will be discussed in detail elsewhere, produces in others a feeling which our own action implies that we have. If a person smiles, we feel that he is friendly and favorable to us; the favorable affective tone generated by humor and pleasantness is sufficient to inhibit the negative reaction called for by critical suggestion.

INFLUENCE OF OTHER PEOPLE UPON ONE'S PERSONALITY

In spite of a number of people who are critical enough of their own personalities and those of others to buy a book such as Dr. Link's *Return to Religion*, it would probably be correct to say that not more than one person in ten is a careful, analytical student of personality changes. Furthermore, it is one thing to be on the contriving end of a technique and another thing to be on the receiving end. Personality improvement, in so far as it involves a guess as to the effects of our own personality on other people, is no easy task.

Let us begin with an uncomplicated situation. Generally speaking, it will be correct to say that when one's personality evokes a favorable response from others, the personality is a "good" one. Conversely, when the total impression which one makes on others as a result of his personality is unfavorable, the assumption is

naturally that some part of one's personality is defective in the sense that it is securing from others responses which are incompatible with one's purposes. In the latter situation an effort should be made to locate the difficulty and remedy it.

If we could count on honest, straightforward responses from others, such responses would constitute an accurate index of their attitudes. But at this point, social custom steps in and plays a part. We all know that people's true attitudes are not always, or perhaps not even usually, apparent. Being unable to accept at face value some of the reactions that we get, we are confronted with the task of analyzing them to see whether or not they constitute a true index of the impression we are making. How is this analysis made? It is made by the observation of minimal cues. Minimal cues in ordinary human behavior, particularly of the deceptive sort, serve about the same purpose as the clues which the murderer may leave at the scene of his crime, and by which he is later apprehended. For minimal cues are partially completed behavior which might have occurred, had it not been inhibited, disguised, or changed. Man's tendency toward crude action remains with him, but society does not sanction most action of this sort. Therefore, although the incipient inclination is there, the actual response takes another turn. Nevertheless, it leaves its traces; these are the minimal cues. For example, certain kinds of personality incline toward actual violence. This is socially inappropriate and inadvisable. Therefore, it usually does not occur. But the glandular reactions and the muscle sets cannot disappear into thin air. Consequently, the response is dissipated in various ways. Sometimes these diffuse movements of betrayal carry on the surface the nature of the original inclination for which they stand; sometimes they do not.

How then is one to know the way in which his personality is affecting others? The hint has been given in our treatment of minimal cues. *Whenever expressed evaluations of one's personality do not accord with concomitant and subsequent action other than the evaluation, one probable inference is that the personality is being unfavorably received.* For example, suppose you are addressing a social gathering after dinner. Social decorum almost guarantees courteous atten-

tion for a reasonable length of time. But suppose as you watch your listeners you note that, although their general mien is one of courteous attention, there are many little random movements such as vacant looks, or tapping of fingers, which indicate that actually you are becoming more and more boresome. The general impression which you are making is a poor one, although no crude negative evaluation has been proffered. Therefore, desist! Too simple, you say. Nothing but common sense! Take a look at the next large social gathering you attend and you will have fallen in with truly remarkable companions if you cannot find at least one person who disregards the signs.

In setting up consistency of responses as our criterion for determining the validity of evaluations which are given to our actions, we have stated the general principle. Particular attention should be called to one application of it, the correspondence of verbal behavior and other actions. We may tell Mrs. Jones that her new hat is beautiful. But if our general conduct does not comport with what Mrs. Jones regards as indicating true appreciation, our sacrifice has been in vain. This social custom of always speaking in favorable terms of the other fellow because we wish to avoid trouble and get a favorable reaction from him in return can, at times, be really cruel. Once during the writer's professional experience it was his duty to interview large numbers of people who were candidates for teaching positions. In this number were many who had failed in several teaching positions. Some of the failures could have been prevented by an honest talk with the candidate. Very rarely, however, did the interviewer encounter anyone who had received even a little straightforward supervision. Usually the people would say, "I can't understand why I cannot get a teaching position. Everybody that I have talked to says I'm a fine teacher. The only reason I lost my last position was that they had a reorganization of the school. My job was abolished." Nonsense! And everybody else knows it. But it goes on and on. The unfortunates themselves are well aware that there is a woeful lack of correlation between what they are told and the treatment they get. Usually their analytical facilities fall short of pushing the matter further. They are the

victims of their own personalities and society's traffic in deception.

One further thing should be said regarding words and actions. If you, as an individual, wish to be convincing, be sure that your own words and actions correspond, and remember this means even to the smallest detail. If you insincerely tell Mrs. Jones that her new hat is beautiful and she finds you out, try to discover how she did it and don't let the same telltale cues escape you in similar situations in the future.

PERSONALITY PHASES AND VERSATILITY IN ADJUSTMENT

So far, personality has been discussed in a somewhat arbitrary way, much as one would speak of his tonsils—either you have them or you do not. It should be recognized that this is merely a convenient method of putting matters. Strictly speaking, personality, judged from the standpoint of the reactions of others to it, changes constantly and is not the same any two minutes of life. Fortunately for human ability to adjust to the world, appearances and traits change slowly enough so that the reactions to them remain fairly constant in a social environment which also remains reasonably stable; thus one is happily spared the necessity of making rapid readjustments. Take the matter of appearance, for example. Unless you are unlike most people, and more fortunate, you have only a limited number of suits or dresses and other articles of apparel. You wear these in some kind of rotation. By and large, however, your appearance remains fairly constant from day to day. As a factor in your personality, it is relatively stable. If you should make such a radical change in your mode of attire as, for example, to appear at your place of work dressed in a Hawaiian grass skirt, your personality rating would change and you would get reactions varying in fairly direct proportion to the radical nature of the change. If you were to appear one day dressed as a Hawaiian, the next as an African Bushman, and the next as an Eskimo, people would be likely to have definite notions concerning your personality, if not your sanity. This exaggerated illustration is employed to emphasize the basic idea that personality is judged in its relation to many

changing elements but its components are usually constant enough to warrant usage with an implication of stability.

But though one's total personality remains relatively constant, it would be wrong to assume that a personality does not usually have definite phases. As a matter of fact, these phases are sometimes so pronounced, as in the phenomenon of dissociation, that the individual is said to have two personalities, or what is sometimes called a "split" personality. The Dr. Jekyll and Mr. Hyde phases of human nature are so well recognized that the expression has become symbolic. Less striking personality alterations are illustrated by the remark, "He seems like a different person when he gets angry." Still smaller changes are insignificant enough to be disregarded, but of interest. Note the following: the figure of the individual whose business reputation is none too savory sanctimoniously passing the collection plate in church; the conscientious employee, during business hours, turning out to be the life of the party; the charming hostess arguing rudely with tradesmen or sales girls; the college professor lecturing in the classroom, conducting research in a laboratory, and for his vacation hunting deer with his friends or touring the country in an automobile with his family; or a student merry and flippant at a party, quiet and noncommittal in the classroom, violent and sadistic in interclass rivalries or initiations, deceitful on examinations, and fair and honest in athletics and in financial matters. In general, then, a relatively constant personality may have marked phases or facets.

Analysis of the problem reveals two general kinds of personality alteration. In one, the individual manifests an awareness of the multiplex nature of his own personality and of the necessity of adjusting to different social patterns. This kind of personality is put on and taken off like a coat. In the other kind of personality phase, the individual is relatively unaware of his own metamorphosis; a character is assumed to meet an exigency of the moment, but after it has been successfully employed, its original purpose may become vague, leaving, however, the newly adopted behavior. Even in multiple personality, where the individual has two or more rôles into which he seems to step with equal ease, the utilitarian

purpose of the adjustment can usually be ferreted out. Most of the extraneous personalities found in one individual have served a definitely useful purpose, such as escape, at some point in development.

When the ulterior phases of personalities are considered, changes in attitudes, conversation, mannerisms, or appearance as the occasion demands are observable. And some people certainly rival the chameleon in making changes! But it would be decidedly unfair to condemn categorically as hypocritical the personality phases which serve ulterior purposes. Viewed in a friendly way, these are the essence of adjustment.

Versatility in adjustment is little more, essentially, than personality adaptation on the controlled level. Versatility also implies considerable shrewdness and analytical ability in evaluating situations and in passing judgments as to which behaviors to employ.

MEASUREMENT OF PERSONALITY

At first glance, it would seem almost impossible to measure so inclusive and elusive a thing as personality. To a certain extent, we find this to be the case; but when personality is defined in terms of objective conduct, the task is not insuperable, for conduct lends itself to measurement, and although it is necessary to select specific phases, the cumulative effect possesses both validity and reliability when a wide enough sampling is taken. In connection with the measurement of personality, a word needs to be said concerning the psychological faker. The faker knows that personality is a topic which is interesting to everyone. He knows further, as everyone else does, that to make the study practical some kind of measurement or evaluation is necessary. Therefore, the faker proposes to teach the naïve client, usually for a decent consideration and in a short time, to read another's character and personality from his handwriting, his face, his birthday, from tea leaves, from lines in the palm of the hand, in fact from practically anything, depending upon how unscrupulous he is or how naïve his client. Of course such methods are wholly unreliable. It will pay us, therefore, to un-

derstand the extent to which scientific means of personality measurement have been devised. There are four main techniques:

(1) *Observation*. Accurate observation is the basis of all science, but in the case of such complex phenomena as are found in human behavior, the selection of significant parts to observe and trace is very difficult. However, a beginning has been made by means of the so-called time-sampling technique. A particular kind of behavior is looked for, such as tics, aggressive conduct, coöperative activity, etc., in one individual at a time for short-spaced periods. Motion picture technique, too, shows promise since behavior patterns can thus be recorded and viewed repeatedly.

(2) *Tests*. Certain segments of personality have been subjected to a kind of quantitative measurement by means of standardized questionnaires which are filled out by the person to be tested. Some of these relate to fears and worries, and the like; some measure the extent to which individuals are in favor of or opposed to various political, economic, or religious institutions; and some indicate in quantitative form the developmental stage a child has reached in his interests and preferred activities. All of these demand the coöperation of the testee and his willingness to answer the questions as honestly as he can. Otherwise the results are useless. There is usually little or no difficulty in securing this coöperation on the tests now in use, though the technique is limited by the fact that certain kinds of information cannot be thus secured.

(3) *Rating by others*. Since personality as defined in this chapter involves the impression one makes on another, a systematic record of such impressions would provide an appropriate means of personality evaluation and measurement. The method employed is to draw up a list of supposedly significant traits or characteristics such as honesty, cheerfulness, coöperativeness, and to ask several persons who know the one to be rated well to rate him on the traits indicated. The rating is usually on a scale of five points, ranging from one extreme to the other. The question immediately arises as to how accurate and dependable such ratings are. If they are unreliable statistically—that is, if another set of ratings of the same

person by the same or another group of raters produced a different result—the ratings would be worthless.

Such does not prove to be the case, however, as Murphy makes clear in the following exposition of the means of checking such ratings:

In attempting . . . to treat such characteristics as accurately as possible, we resort to devices in which measurement depends upon some form of estimation. If the estimation is made in terms of checking various numbers, as in the following,

1	2	3	4	5
Very aggressive	Aggressive	Moderately aggressive	Retiring	Shy
or				
<i>Degree of Aggressiveness</i>				
1	2	3	4	5
Great	Large	Average	Small	Slight

we have a sort of *rating scale*. Individuals may rate others whom they know, or in special cases they may rate themselves. Data collected in this way must be carefully checked by various techniques. One way of checking is to demand the identical ratings from the same raters a month or two later and to see how consistent the raters' performances are in judging the same people. Another method is to compare a large number of independent judges' ratings with one another. The third method is to compare ratings on supposedly identical "traits," the descriptions of which are phrased in different ways—to see, for example, whether a person who is rated high in conceitedness is rated low in humility. On the basis of the work done, it may safely be said that judges agree with one another fairly well about the traits shown where the person's actions are such that his associates can *see* the trait in action. Thus, traits like aggressiveness and submissiveness can be rated rather well. Other traits, dependent more upon inner activities such as purposes and ideas, cannot be rated well enough to be worth the time.¹

(4) *Self-analysis*. Self-rating blanks are readily available commercially. However, it is not necessary to purchase such blanks in order to obtain a helpful rating of one's own personality. The suggestions given above in the quotation from Murphy apply here,

¹ Gardner Murphy, *op. cit.*, p. 477.

particularly the recommendation that traits to be rated should be defined in objective terms so that the estimate can be narrowed to specific behavior, and that the ratings should be repeated at intervals over a fairly long period.

ABNORMAL PERSONALITIES

No two individuals are the same. But some people are so different from the "mill run" that for purposes of convenience they may be called abnormal even though the norm by which they are evaluated is arbitrary. Before mentioning several types of abnormality, two definite points should be stated in connection with the concept. First, abnormality is a relative term. W. L. Uhl¹ has made this quite clear in an extensive discussion of normal conduct. What we mean when we say that abnormality is a relative term is that being abnormal means being more extreme in some kinds of conduct than the majority of people with whom one associates. Second, much abnormal conduct is learned. There has been a tendency among some social workers and even some psychiatrists to regard all personality abnormality as some hereditary curse about which nothing could be done. Evidence is quite to the contrary. The baby that is born unable to breathe is not exhibiting a learned non-breathing response, but the child who holds its breath and pounds the floor with its heels in a paroxysm of rage probably did learn the reaction.

With the foregoing two qualifications in mind, we are now ready to classify abnormal personality conduct. We shall recognize five types of personality maladjustment. They are:

(1) *Personality disorders resulting from impaired sensory equipment.* All knowledge is based upon sensory data. When the sensory avenues are impaired, knowledge suffers accordingly. This is bound to have its effect on the personality.²

(2) *Unbalanced early training.* Attention has been frequently called to the early years. Habit formation shows itself no more

¹ F. F. Powers and W. L. Uhl, *Psychological Principles of Education*, chap. XII. Century, 1933.

² J. B. Morgan, *The Psychology of Abnormal People*, chaps. II, III, and IV. Longmans, Green, 1928.

strongly anywhere than in the development of abnormal personality. Many of the habits by which we are judged are formed early.

(3) *Overcompensation type*. It has been said that conceit is the anesthesia that enables little minds to endure themselves. Overconceit is a form of overcompensation.

When one receives a social rebuff, his natural tendency is toward emotionalized retaliatory behavior. But society, in turn, is likely to suppress this retaliatory behavior severely. The policeman reprimands sharply. One is tempted to strike him. If one yields, an arrest follows. Fortunately, human beings also have the ability to rationalize themselves "out of the hurt." Consequently, if one does not receive an invitation to some social function which he would like to attend, he can always recall that he beat his snubber one time at tennis. This kind of ego salve works very well—too well, in fact, for one is likely to become an addict. When compensation becomes expansive and habitual, it has outlived its usefulness.

(4) *Introversion*. In general, introversion implies more than average interest in one's own ideas, imaginings, feelings, and doings. It means preoccupation with one's own mental processes and attitudes, and with the attitude of others towards oneself, whereas extroversion means preoccupation with or interest in external events and things and spontaneous participation in what is going on in one's environment. Both introvertive and extrovertive behavior, except in their extreme forms, are normal to everyone. In fact, the attempt to distinguish between introverts and extroverts is exceedingly difficult and in many cases impossible since most individuals are ambiverts, having some introvertive and some extrovertive tendencies and traits.

On the whole, the introvert tends to participate less than the average person in social affairs (of the informal sort), sports, politics, and selling. He is more sensitive than the average individual and much given to reactions in which imaginary realizations are often substituted for ends sought. Moreover, he tends to give a personal reference to impersonal remarks. Instead of depending on his social environment for his cues, he will frequently hold his opinions in spite of his environment. Instead of capitulating, he often main-

tains his position and not infrequently tries to bring the world to his view.

In extreme cases of introversion, the individual shrinks and withdraws from stimulation. This tendency is readily observable in the schizoid personality.

While a certain amount of introversion is normal, we now know that the condition can either be kept normal or be made unhealthy under the impact of poor health, misunderstanding parents and teachers, and a cruel environment. The unfavorable factors may literally force a person to withdraw more and more within himself, whereas a more favorable situation and a better attitude may keep him in "balanced control," health, and happiness. Early in the life of the child the introvertive tendency can be counteracted with relative ease, but later this is more difficult.

(5) *Emotional imbalance.* Emotional instability is a very common occurrence and is often a result of faulty early training. Many persons of striking and interesting personality are characteristically unbalanced emotionally. The reason for this, in some cases at least, is probably that elaborate demonstrations of emotions constitute an interest in themselves.

CHANGING ONE'S PERSONALITY

We have discussed personality from many angles. We come now to a summary of certain practical rules for conduct. Of these there are three:

1. *See that you are progressively informed on social customs.*
2. *Select your interests and ambitions wisely in terms of your abilities and opportunities.*
3. *Have a definite philosophy of life.*

At first glance, the relation between these cardinal points and personality improvement may not be clear. They have only been hinted at before. But all three have a direct bearing on personality improvement. If one keeps himself progressively informed on social customs and their changes, he is able to conform to them. If he is following conduct lines which are interesting to him, he is more likely to succeed, for interest and success are closely bound together.

Success in turn will lead to happiness and a pleasing personality. Behind it all there should be a philosophy of life, without which the totality of one's conduct cannot be integrated into the cohesive pattern that is personality.

This chapter may well be closed by three quotations illustrating these three main principles of conduct and personality improvement. Sandwick has given a practical illustration of the place of manners in personality and their dependence upon social custom. He says:

Rules of politeness are rules of common sense used to promote kindly, happy relations between people. "Courtesy" is said to have taken its name from courts where the group about the king early developed charm of manner and considerate behavior.

When one has not been in the habit of using polite manners, such manners may seem insincere. In that case one should practice the correct manners on all occasions till they become natural. Then no sense of awkwardness and insincerity will be felt. Especially should there be no difference between home manners and company manners. The girl who is suave, polite, and engaging in public and coarse, snappish, and inconsiderate at home deceives no one. The hollowness of her manners is easily discerned. Good manners may be made a person's own if he practices them everywhere and on all occasions.¹

Robinson offers an excellent discussion of the place of interest in personality development in a stimulating chapter in his *Practical Psychology*. In concluding his discussion of personality development through the cultivation of proper interests, he says:

There are nevertheless certain general rules about the selection of such interests which may well be kept in mind.

1. Guiding interests should be in the world of reality rather than in a fictitious world arranged to suit one's fancy.

2. Guiding interests should fit in reasonably well with the community in which we live. Even if we cannot support the main beliefs and interests of that community, we shall get on much better if we at least make an effort to understand why the ideas of those around us are not the same as ours.

3. We should learn to see ourselves from the other fellow's point of

¹ R. L. Sandwick, *Study and Personality*, p. 213. Heath, 1929.

view. This does not mean giving up our own interests, but merely learning to realize how we must seem to a person whose interests are other than our own.

4. Guiding interests should be in definite accomplishments rather than in the cultivation of abstract traits of character or in the reaching of remote and improbable goals. It is wise to hitch our wagon to a star only if we are willing to forget the star's pulling power and to depend largely upon the pushing power which we can exert upon our wagon from behind.

5. We should seek knowledge about what our dominant interests really are. The fact that we have dominant interests does not mean that we even half understand them. Yet such understanding is necessary for the attainment of self-control.¹

It should not be necessary to labor the point of the importance of a definite philosophy of life in personality development. Few people who are truly happy lack a consistent life philosophy, and personal happiness is a requisite of wholesome personality. Wheatley and Mallory submit for approval their own philosophy of life, which constitutes an excellent termination for this chapter.

THE AUTHORS' PHILOSOPHY OF LIFE

1. To be abundantly healthy in body and mind.
2. To be happy, tolerant, and coöperative in ethical and religious activities and relationships.
3. To be happy, coöperative, and efficient in home life, first as a child and later as a husband or wife and as a parent.
4. To be happy, tolerant, coöperative, efficient as a citizen of one's local community, state, nation, and the world.
5. To be happy, efficient, coöperative, in a suitable lifework, receiving a fair income and saving a reasonable part of it.
6. To be happy, tolerant, coöperative, and efficient in spare-time activities, both pastimes and hobbies, and at the same time to broaden one's interests.
7. To be grateful for all favors and blessings, reasonably trustful of others, and optimistic of the future.
8. To be habitually unprejudiced, openminded, willing to welcome changes, and never ceasing to learn and to develop.

¹ E. S. Robinson, *Practical Psychology*, p. 438. Macmillan, 1934.

9. To be actuated by the twofold ideal of living the most complete life oneself and helping others to live equally complete lives.
10. To be loyal to, and to contribute to the best interests of, one's home, school, church, vocation, recreation, community, state, nation, and the world.¹

QUESTIONS

1. What is the definition of personality given in this text? How would you improve it?
2. What are the commonest motives involved in changing our personalities?
3. What are some of the personality factors beyond our control? Do you think they must necessarily remain so throughout all time?
4. To what extent can a person's personality be influenced or changed without his coöperation?
5. Do you think consistency or versatility more useful as a personality type?
6. Make a list of personality traits both desirable and undesirable, and get several friends to rate you on these traits. Compare their ratings with your own.

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¹ W. A. Wheatley and R. R. Mallory, *Building Character and Personality*, p. 353. Ginn, 1936.

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CHAPTER V

PSYCHOLOGY OF ADJUSTMENT

MEANING OF ADJUSTMENT

One can illustrate the meaning of adjustment by noting some of the changes in behavior which a new college environment usually makes necessary. Living in a dormitory or fraternity house for the first time, the student soon discovers that his customary freedom must be curtailed. He must not sing loudly or use the radio during study hours. He frequently has to repel loquacious visitors who waste his time. He has to eat what others eat instead of requesting favorite dishes. He has to manage his time himself—study halls and directed study by teachers are not available. He must make choices alone which he previously made in consultation with his parents. He may be startled by new political and economic ideas which violate the community or family dogmas he has long accepted. New religious concepts may act as deeply disturbing stimuli leading to bewilderment, disillusion, and sometimes, unfortunately, to despair. He finds that talking about his high school athletic, dramatic, or forensic prowess not only fails to interest his new friends, but often tires them. At the first grade report, he may be shocked to receive C's instead of the A's he was accustomed to in high school. This necessitates revising the estimate of his abilities in relation to others. He is told that college has more severe standards of scholarship, and also that an A from one high school may be equivalent to a C, or a D, or even an F from a second high school.¹ He may dis-

¹ This is easily shown by the fact that on one of the state-wide tests of achievement in physics, the students in two large Iowa high schools made scores the distributions of which were mutually exclusive. In other words, the student who made the *highest* score in one school was below the student who made the *lowest* score in the second. The former may have received an A and the latter an F.

cover that he can seldom finish a library reading assignment, and that, in comparison with other students, he reads much more slowly, and retraces passages much more frequently to keep the train of ideas. Or he may suffer disappointment because, although he was on the varsity squad or in the glee club back home, in college he makes the scrub team by a hair, and fails in the chorus tryouts.

All such new situations, for which old behavior proves ineffective or unacceptable, are occasions for adjustment. Continued inability to deal satisfactorily with these circumstances is attended by more or less severe emotional tension and distress. One feels out of step or out of caste, confused, vaguely insecure, or decidedly frustrated in attaining what he most desires at the moment. These tensions and distresses, however, as we shall soon see, are biologically significant. The situations which distress us may bite and sting, they may deflate and upset, but they spur the organism on to change and growth—or, it may be, at times, to retrogression. When life loses its ups and downs, when complacency and satisfaction envelop the organism in a warm glow, learning and growth may cease.

Biological nature of adjustment. Adjustment is a concept of major importance in biology. Organisms are adapted to an environment when their behavior in relation to the “world outside” is adequate to support satisfactorily their life processes. In the case of organisms far down the evolutionary scale, the behavior mechanisms which are evoked by a combination of internal organic conditions and environmental forces are essentially fixed in nature. These organisms are adapted to their environment so long as the external world remains substantially the same. Because they have the structures they do, and because they are capable of the behavior they exhibit, they are the surviving forms of life. Other organisms, less well equipped to carry on life processes in the environment in which they occurred, have completely or largely disappeared.

These lowly forms are relatively incapable of *progressive* adjustment. When substantial environmental changes occur, their essentially fixed behavior patterns prove inadequate. Unable to invent new ways of reacting, or having so small a repertoire of possible responses to the new situation that there is little chance of hitting

upon an effective one, such organisms die, for they are no longer adapted to the kind of life they must live in order to survive. During the long evolutionary drama, individuals and species by countless number have thus slipped "over the edge of the universe."

Man is most adaptable. Man happens to have fewer fixed responses than lower animals, and because his behavior is capable of almost infinite adaptation through new combinations of reactions directed toward new ends, he is least of all the victim of environment, of the accidents and perversities of nature. But he, too, may find continued adjustment difficult, for he has too often let the day be sufficient to the ends thereof, and his lack of foresight has left him unprepared for catastrophic social change. Although man has learned to protect the functions necessary to life in his widely varied natural world, he may prove to be unable to adjust his behavior to the bewildering and swirling world of politics, economics, and international affairs which he himself has largely created.

The adjustment cycle. The adjustment process is a peculiar cycle. Man's behavior is evoked by stimuli which arise in the environment, but what forces he will attend to and respond to are determined in part by his physiological status, his mental sets, his purposes, and his emotional dispositions. When he has acted, he has attained a new balance between the outside and inside forces, and this means that the organism itself has changed. But so has the environment! Now further behavioral adjustments of the organism arise, resulting from the impact of a changed environment upon a modified organism. This cycle of the adjustment response has been summarized as follows:

The response depends upon

- I. the present stimulus
- II. the individual, and thus upon
 1. his structure, dependent upon
 - a. his heredity
 - b. his previous environment
 2. his present condition
 - a. chemical
 - b. emotional

3. his activity in progress (the response to any stimulus differs according to the activity in which the individual is engaged at the moment) including
 - a. his situation-set (the organism is oriented in a particular environment; the individual is in intimate relation with his world)
 - b. his goal-set (when the individual's activity is directed toward a certain result) ¹

Human adaptability promotes change. The tremendous variability and creativity of behavior which arise from the impact of a human organism and its social and natural world, and from the constant contact and clash of social groups and cultures, have resulted in a progressive acceleration of change. A cursory search of the two-volume work on "Recent Social Changes" ² reveals the tremendous range of individual and social adaptation called for in a fast-moving universe of social behavior. Some, though few, of these changes individuals and groups have deliberately plotted. Some are the inevitable results of forces man has set in motion, but whose consequences he could not foresee. Some are the result of man's failure to reconstruct his purposes and values as rapidly as he has invented machines and devised industrial and commercial processes. Many of these social changes, such as the greatly altered occupational patterns in relation to man's vocational adjustment, have a close personal and individual reference. Others, more remote, but ultimately as crucial to the individual, have to do with broad group and institutional behavior. Among such problems are those connected with the clash of interests between workers and employers and between the privileged and the underprivileged, and the needs and ambitions of nations, races, and cultures. The tremendous changes in morals, in social attitudes, in polite customs, and in other human relations are humorously but strikingly portrayed by the series of cartoons "Born Thirty Years Too Soon."

¹ R. S. Woodworth, *Psychology*, p. 13. Holt, 1934. The parenthetical explanations have been inserted by the writer of this chapter.

² President's Research Committee on Social Trends, *Recent Social Trends in the United States*. McGraw-Hill, 1933.

Danger in habit. Man has found that many of his adjustments, once they are forged out of experience, should become matters of habit for the sake of greater economy in living. Even in the rapidly changing mores of today, it is still possible to stereotype much of our behavior and let it remain unchanged for long periods. But there is an inherent danger in habit. Reactions may persist long after they have ceased to be adequate to the realities of a situation. This is eminently true in the case of ideas about politics and economics. Most of our political institutions were established in a day when local communities were relatively self-contained. Now, when every section of the country, every segment of the population, is intimately dependent upon every other, we stubbornly mouth the old platitudes of localism. In a day when nations are suffering intensely because they are trying to live alone although they are inescapably members of a tremendous social organism, no part of which is in fact independent of any other, rulers and parliaments doggedly try to coax prosperity by means of an energetic but dangerous nationalism.

Progressive adjustment essential. The ideal of adjustment, therefore, is adjustability. Adjustment connotes too much of habit and rigid behavior, whereas adjustability implies the use of the environment for the attainment of personal and social purposes. It involves the ability to recast one's reactions to fit new needs and changed conditions. It means the ability and the desire to break old habits and build new ones. If the oft-repeated maxims that "an old dog cannot learn new tricks" and that "no one ever gets a new idea after thirty" are true, the coming of a new and better world will always be attended by the stress and strain occasioned by the obstinate resistance of the old and the impulsive excesses of the new.

Although it would be fruitful to consider more fully the crucial problems of societal adjustment, the remainder of this chapter will deal with the more intimate process of the individual's management of himself with respect to his personal needs and the conditions of social interaction.

Organism plays dynamic rôle. The concept of personal and social adjustment assumes a dynamic organism. Man is not a passive

receptor, a blank tablet on which experience writes or a mass of putty which the environment moulds. He has commanding needs, both physiological and psychological. He needs food when hungry, sleep when weary, water when thirsty. The organism, blindly at first, reaches out into the environment for the means of satisfying these basic drives. Man also wants social approval and the satisfactions which come from mastery. Now he tends to submit to the domination of others; again he attempts to make others submit to his demands. Because of his capacity of foresight, of projecting events into the future, he entertains purposes and works toward deferred goals and satisfactions. Human beings are striving, wanting, purposing organisms. Man's doings may be thought of as means of satisfying basic wants of hunger, sex, thirst, sleep, warmth, and the like. Again, his reactions are means of securing the approval of others, or of dominating others. He may sacrifice immediate satisfaction and tolerate considerable annoyance if the attainment of deferred goals makes it necessary. Man's adjustments, in other words, are the responses which serve his needs. In attaining these satisfactions, he learns many ways of acting. The youngster utilizes temper tantrums to manage his parents. The young woman flatters her sweetheart to get her own way. The professor nags his timid students to bolster an ego mutilated by a shrewish wife. The instructor works day and night to publish research which may make him a full professor. Another gives time freely to students because he is intensely interested in teaching. A great humanitarian braves ridicule, invective, persecution, and violence, to protect the underprivileged.

The adjustment process. Shaffer provides an excellent outline (see p. 100) of the adjustment process. An individual is proceeding in a course of motivated behavior (1) toward an end result (4). When thwarted or blocked, he makes varied responses (2) until by some action (3) he overcomes the obstacle and proceeds as before. The principal steps in the adjustment sequence are therefore the existence of a *motive*, the operation of some *thwarting* which prevents its immediate satisfaction, and *varied response* leading eventually to tension reduction or *solution*.

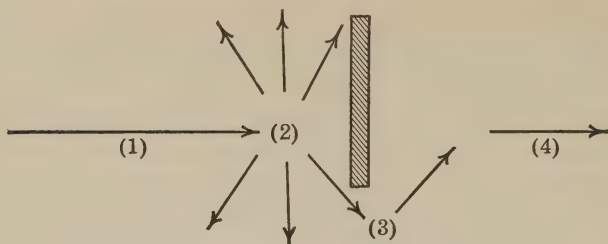


Fig. 1. THE PATTERN OF ADJUSTMENT ¹

The obstacles to the attainment of the goal may be of several sorts: (1) an environmental obstacle, as when a parent forcibly restrains a child from taking a desired object, or a student is discouraged from making good grades by a group taboo on scholarship; (2) a personal defect of the individual, such as a deformity which creates a barrier to normal social contacts; (3) a conflict of motives, such as that which results when wanting to be a "good fellow" clashes with deep-seated moral convictions.

The persistence of motives, and the emotionalized behavior which results from thwarting, create tensions or stresses in the organism. One author ² describes motives as irritants. To him the dominant human motives are the primary annoyances or distresses. The effect of stimulating conditions frequently is to destroy that balance between organism and environment which is adequate to satisfy the individual's needs and further the necessary processes of life. When these life processes are going on well, it may be said that the organism has attained a dynamic equilibrium. To disturb this equilibrium is to stimulate the organism to learn—to adjust; for it is inherent in living things to do whatever is sufficient to maintain their equilibrium, and to struggle to regain a satisfactory state of affairs once lost, or at least to reduce the tension to a tolerable amount.

This resolution of tensions, this removal of stimuli as distresses,

¹ L. F. Shaffer, *The Psychology of Adjustment*, p. 116, after Dashiell. Houghton Mifflin, 1936.

² H. L. Hollingworth, *Educational Psychology*, p. 60. Appleton, 1933.

this return to satisfactory balance, constitutes an adjustment. An adequate adjustment is one which most directly and completely resolves the tensions created by motivating conditions and the appearance of obstacles. Better still, adequate adjustment is that which results in a reasonable balance of satisfaction among one's many motives, and that which enables an individual to live without severe friction both in his natural and social worlds and in his internal world of wants, ideas, and ideals.

Every individual should welcome struggle. Conflicts offer precious stimuli to learning, to the invention of new and better ways of living. They are the means of acquiring fiber in the personality; crispness of attack upon the world; toughness in withstanding shock, failure, difficulty; self-confidence and self-dependence. Personality is not inherited; it does not come from mandate or from wishing. Maturity does not evolve from ease and luxury, from pampering or from psychological coasting. Through actual accomplishment, through victory in adjustment, one grows to independent adult status.

Adjustment by direct attack. There is a variety of ways in which the individual may deal with obstacles to the attainment of goals and satisfactions. Effective adjustment demands an energetic "eyes open," alert, direct attack on the difficulty. This usually involves an objective, factual analysis of the situation. If one is failing in his work, or getting unsatisfactory grades, it is only sensible to determine what the obstacle to success is. If it is lack of study and concentration, one can think quickly of pertinent means of remedying the situation. If it is lack of reading ability (a very frequent cause of low scholarship in college) one can secure help in improving his rate and comprehension of reading. If physical conditions stand in the way, such as improper diet or glandular malfunctioning, steps can be taken to improve the situation. If one is not making friends as readily as possible, an equally frank objective analysis is helpful. He may discover that he talks too much, and decide to give others the first and last word. Instead of asserting his conversational interests and activity preferences, he may decide to think more frequently of the wants of others.

Students often need to define their purposes for attending college. Did I come merely because it was the thing to do? Did I come merely for social pleasure? Am I willing to expend the energy it takes to make good? Am I interested in liberal training, or have I become too absorbed in special activities? A frank facing of purpose—or lack of it—and a subsequent definition of worthwhile goals is a direct attack on many a college problem.

Since vocational and educational guidance do not function efficiently as yet, many students enter college with educational and vocational ambitions poorly articulated with their mental abilities and special aptitudes, or their emotionalized attitudes. Difficulties are certain to develop early in such instances. These problems call for the courageous analysis of one's interests, abilities, special aptitudes—and perhaps economic resources—in the light of the demands of his chosen vocation. Frequently this analysis must lead to a readjustment of one's goals so that their attainment is within the possibility of realization with reasonable effort.

A direct attack on one's problems is a sensibly persistent attack upon them. If special knowledges, abilities, and skills are necessary for success in solution, one should be willing to spend the time necessary to acquire them. Many people accept defeat too easily. It stands to reason that the effective response may emerge only after an extended series of trials. Too often we give up before we have varied our behavior sufficiently to make possible, either by design or accident, a solution of our difficulties.

Intelligent compromise. The revision of goals in the light of abilities and aptitudes is an instance of intelligent compromise. There are times, furthermore, when the attainment of purposes, though possible, would demand an expenditure of energy and a tolerance of tension too great to be worth the cost. When a sensible compromise has been worked out, it should be a clearly conscious arrangement in which there is no flirting with self-delusion and no indulgence in effusive (and usually futile) efforts to keep the facts from others. The writer has seen students who have been dropped from medical school after one or two years of hard, conscientious effort to succeed, go through the very real agony of trying to read-

just vocationally and retain their self-respect at the same time. To be counted a failure by one's parents and friends is bad enough; to know it oneself is worse. To maintain one's self-respect, to save one's personality from mutilation, to maintain one's integrity, is as basic as any tendency of human nature. It is hardly surprising, therefore, that some try to relieve the sting by distorting the facts. It is possible under failure to blame the professor, the circumstances, or the lack of parental sympathy, or to convince oneself that physical weaknesses or ailments were responsible for defeat.

Substitute adjustment. In other words, adjustments are not always made by direct action, by realignment of forces in objective and frank fashion. Instead, persons frequently resort to elaborate means of escaping from the problem, of distorting the issue, or of unconsciously "faking" a solution. This "substitute adjustment" may take many forms. It is possible to escape by making believe the difficulty does not exist; by consistently avoiding the issue, putting off the evil day, detouring around the problem. One may invent excuses for not attacking the obstacle, or may indulge in brave shadow-boxing to give an impression of aggressive attack. One may simulate illness to avoid self-admission of failure or fear. One may blame others, and pose as a martyr to the evil designs of harsh persons and events. One may indulge in make-believe by substituting an unreal world of success for the real world of defeat or laziness. Burdens may be shifted to the shoulders of parents, friends, or the Lord. One may acquire a "brave" resignation in the face of fate. He may slip back to an earlier level of adjustment where the problem did not exist. He may spend his energy in fretting, worrying, and fuming instead of analyzing motives, obstacles, and possibilities of good self-management.

These devious and distorted disguises are only partially satisfying adjustments. In fact they are really maladjustments when projected against an objective world of self and environment. The key to maladjustment is self-deception. Unfortunately, with continued practice, self-deception occurs with little effort, and finally without consciousness of escape. One buries his head in the sand without knowing it.

There is a great variety of forms of inadequate and self-deceptive adjustment, which, in habitual or severe form, are classified as definite maladjustments. Authorities do not agree on the classification of these forms of behavior, but the following are among those frequently mentioned by writers in the field: adjustment by defense; adjustment by withdrawal; escape by ailments. These will be discussed in the next three sections.

ADJUSTMENT BY DEFENSE

Mr. A was superintendent of schools in a small town. He gave the impression of being a competent schoolman, but in his relations with parents and the general public he gave constant offense. He was short-tempered and often disagreeable over the telephone. He was cool and distant to callers. He was rude to those who made criticisms or suggestions. He frequently refused conferences, even though he should have had sufficient time for them. He was stiff and somewhat pompous in public, although he usually refused to participate actively in civic or social affairs. He was resentful, without apparent cause, against members of the faculty of the college which was located in the village. He seemed to carry a chip on the shoulder at all times. He earned the reputation of having a sharp tongue and of being "stuck up."

Those who, in spite of his brusque exterior, came to know him well found him not obsessed with a sense of superiority, which was indicated by his overt behavior, but by a deep-seated feeling of inferiority. His is a characteristic form of defense. The bluffing, bullying, swaggering, pompous, testy, domineering, resentful, overcritical behavior of many persons is an attempt to "cover up" in public and to bolster their own flagging fortunes in self-respect, confidence, and ability to get along in a highly competitive world.

The sense of inferiority may result from imaginary or real inadequacy of intellectual, social, or physical traits in comparison with other members of the group. The inability to compete may result in such symptoms as ideas of self-reference; seclusiveness; undue sensitiveness to criticism; overresponse to flattery; and poor reaction to competition expressed in early acceptance of defeat, in

invective, in charges of unfairness, in a haranguing against circumstances and fate, and in an elevation of self-respect by derogation of others.

Hazing of freshmen by sophomores is hard to stamp out because those who resented their ignominy at the hands of sophomores are most anxious to retaliate the next year. Sometimes, also, the sophomores who are most vicious in their attacks upon the "yearlings" are the weaklings, physically or socially, who use tradition, custom, and group protection to bully their victims. The same mechanisms can be viewed in almost any fraternity "informal" initiation where humiliation of the neophytes is the underlying purpose.

The "will to power." Adler ¹ builds his system of individual psychology around the compensations which organisms tend to make for their inferiorities, particularly those which are organic or physical in nature. The driving motive of personality he conceives to be the striving for superiority and domination—the "will to power." The normal individual is one whose goals are consistent with his abilities. He is able to secure the satisfactions of mastery and social approval in socially acceptable ways on a level of competition where he can actually succeed. When one's purposes are too exalted for one's powers of accomplishment, when he is trying to excel in activities and among persons where competition can only lead to failure, or when his physical traits stand in the way of success, he may become inflicted with an "inferiority complex."

The reaction to an inferiority complex is to compensate for it in some way. Goals which are inconsistent with abilities and objective conditions are set up, and compensatory behavior is directed toward these ends. Overcompensation ensues; excessive activity, highly emotionalized in character, is applied for the attainment of the objectives.

Compensation as such is not undesirable. Common sense directs us to expend our efforts where they will be most fruitful. The entire guidance program of modern schools and colleges is designed to assist the individual to choose educational and vocational goals defensible in terms of his ability to achieve and compete. Evidence

¹ Alfred Adler, *Understanding Human Nature*. Greenberg, 1927.

concerning the abilities of man shows conclusively that they are positively related. There is no reason to believe that one who is low in some trait in relation to his fellows will, with great probability, be correspondingly superior to them in some other trait. Popular opinion to the contrary notwithstanding, there is no assurance that the "dumb" will be beautiful, or that the one who learns with most difficulty or most slowly will remember longest. Nevertheless, the positive relation among an individual's traits is by no means perfect. In other words, while the abilities of a person will cluster more closely around a norm or average of his own, rather than around that of other individuals, the profile of these abilities will be uneven, will show considerable variation. Through objective measurement of traits, through careful analysis of experience, and through exploration and tryout, one should assess his real possibilities, and plan his strivings in terms of them.

Occasionally tremendous effort in direct compensation—that is, aggressive attempts to improve in the area of one's deficiencies—may lead to success. Some strong physiques have been developed from puny bodies through long cultivation. Ordinarily, however, this is a futile dream, and one should turn his attention to more attainable goals. It is when compensation takes the form of dogged attempts to realize unwise purposes, or when the defenses against inferiority or inadequacy obscure objective conditions or delude one concerning the facts, that the mechanism becomes undesirable.

Unnecessarily stringent prohibitions, constant nagging, or continual repression on the part of parents often batter down the ego of a child. Children's wishes and opinions, their hopeful contributions to the general good, may be met with disregard, disparagement, or even ridicule. The child, like an adult, must feel an integrity of the person. It has characteristic needs which demand satisfaction. It too has a "will to power." Mastery and success, social approval and self-respect, are as potent in the young as in the old. When the cold aloofness or the stern repressions of an adult society splinter the personal integrity of childhood, compensatory behavior in the form of resentfulness, negativism, aggressive resistance, or attack may constitute the adjustment to inferiority and persecution. Or

the child may accept defeat and futility in trying to satisfy his needs in the real world, and withdraw into the secret comfort of the imagination.

Parents frequently evoke feelings of inferiority in children by insisting on standards of accomplishment inconsistent with aptitudes and interests. The writer knew in college a young man who never should have attempted higher intellectual tasks, but who was stubbornly and mercilessly held to continued failure by his father, a member of the faculty. In his own class, the father ridiculed the boy before the entire group. The student was constantly the butt of fellow students who took advantage of his intellectual naïveté. What little competence the young man had was undermined by the emotional effects of these experiences.

Oversolicitous and dominating, but inherently kind, parents also contribute to feelings of inferiority. Children must progressively acquire self-dependence. To do so they must be given opportunity to initiate activities and carry them through to completion. They must make choices and learn to take the consequences. When parents make all the choices, overpamper and protect, carry all the burdens, and uniformly assert their wishes before the child's, they dispose youth to dependence and to timidity in fighting battles of survival. This can only lead to incapacity and inferiority.

Compensation for physical inadequacy. B was a student whose compensation mechanisms protected an inferiority caused by severe physical deformity and supported by an excessive egocentricity fostered by parental pampering. This young man had an exceptionally brilliant mind although his scholarship was badly spotted through unwillingness to apply himself to any tasks in which he was not intensely interested. But his body was so misshapen that it was grotesque. Alert, almost too piercing eyes were set in a lean, cadaverous face. Only by using crutches could he shuffle about. His body was twisted, one leg practically useless. The personality was almost as misshapen as the physique. This student, although he had been advised to leave another institution because of general failure to fit in with the life there, was received in the second college with real sympathy and concern. Students were friendly in the

beginning. One instructor in English, in which the student had unusual proficiency, was particularly kind and helpful. B soon revealed exceptional aptitude in creative writing and art. His work was published in the literary magazines, and his illustrations were used in the annual and other publications. Everything pointed to a happy and fruitful experience for him. Then certain young women began to receive threatening notes. It turned out on investigation that they had declined engagements with B. The latter began to make sharp derogatory comments concerning other students and faculty members (many of whom had been kindly disposed toward him). He increasingly insisted on dominating group conversation and otherwise holding the center of the stage.

He gathered a group of younger students around him, to whom he read poetry, including some of his own morbid verse. This small audience finally organized as a club with B at its head. Then a series of petty depredations and escapades began to occur, in which, it was finally revealed, B was the master-mind. The little club turned into a sort of voodoo organization, with B the dispenser of sorcery. For weak and unsophisticated students, this person held a kind of strange fascination, and over his satellites he wielded a real power. Other students were drawn, first to be awed and then terrified by the rituals of the group. Finally one of the most naïve of the followers turned up late at night at a priest's home begging for protection from what he said to be certain death which was to be visited upon him through the influence of B. After this episode led to the exposure and dissolution of the club, B turned to invective and threats against his "deserters" and his enemies. These actions finally not only took his subservient puppets from him, but resulted in almost complete loss of student associations.

This student had been pampered ever since a childhood disease had deformed his body. Parents and their friends had showered attendance and satisfied his every whim with the sincere purpose of tempering the bitterness of not being able to do what other boys did. But even one so unfortunate must learn to face facts bravely, and work out a plan of life in which the inevitable limitations are

recognized. B had aptitudes which offered productive means of compensation, but his training had never taught him to meet reality frankly and constructively.

There is a well-recognized group of *compensation mechanisms* by which individuals avoid the objective assessment of motives and responsibilities for action. *Rationalization* provides a convenient means of justifying one's behavior by assessing "trumped up" reasons and unreal causes and motives. A student may excuse his neglect of academic opportunities by recounting the much more practical and functional training secured in extracurricular activities. Laziness may be excused by illness. When chided gently by his father for low grades in arithmetic, a schoolboy replied, "Well, Dad, they give us sixth grade problems in the third grade." Rationalization is a means of excusing oneself, of quieting "conscience," and of saving self-respect.

"*Sour grapes*" is an epithet thrown at the person who disparages the much greater achievements of another, or the motives and goals for which he and others once strived, but only the others attained. It is a device for devaluing what one wants but cannot get, and for leveling the differences between those who have and those who have not.

The "*sweet lemon*" reaction is a form of rationalization in which one professes to accept with resignation conditions which he does not want but does not know how to avoid. One may really be "stewing in his own juice" but pretend to enjoy it.

Children frequently find it possible to escape punishment by blaming other persons or unavoidable conditions. Later, this kind of behavior may be extended to the level of self-deception also. An acquaintance owned a vicious police dog which, on the testimony of many impartial observers, attacked nearly every dog in the village. The writer, seeing that the dog was bloody and torn about face and ears from fighting, once remarked to the owner that his pet had been in another brawl. Whereupon the master replied, "Yes, all the dogs in town pick on him." Most small boys who like to fight blame their opponents for starting the quarrels. Men blame their wives for their vocational failures. Students blame

objective examinations for poor grades. It is much easier to shift the blame and the motive than to accept them.

Projection is illustrated in the tendency to ascribe to others the faults, the motives, the conflicts which one has himself. This device is at once a means of comfort through company, and a means of feeling righteous at the expense of others. It has been noted that people who have severe conflicts usually become fanatically condemnatory of the acts they inarticulately wish to indulge in themselves, and ascribe to others, with derogatory evaluation, the motives which rather "unconsciously" plague themselves.

Delusions are forms of compensation characteristic of more severe loss of contact with reality in managing conflicts. A delusion is a false belief, self-contained in the sense that it remains undisturbed under the logical analysis of other persons. The delusion of persecution is a means of asserting the importance of self, since only a successful and powerful person need be conspired against by others.

Student C was a pampered boy extremely dependent on a dominant and oversolicitous mother. He had never been allowed to join in the healthy play of other boys because of a supposedly frail physique. Other social contacts with those of his age were rigidly restricted. At the time of entrance to college, he was shy and timid, academically ambitious beyond his ability, psychologically immature and dependent. The lack of social adjustment during earlier years was accentuated in college, and failure to participate led to more seclusive behavior. Bewildered by lack of attention and affection—his house-mates treated him as casually as any other in the beginning—and thrust on his own responsibility too definitely, he escaped the new environment by weekly trips home. He was unable to achieve as he expected in his courses, and his scholarship was still further lowered by frequent home visits, brooding over his conflicts, and consequent emotional depletion. Included among his difficulties was an unnecessary worry over sexual impulses and acts which he considered wrong and harmful. He constantly offered illness as an excuse for uncompleted assignments. These fabricated pains increased as the severity of his conflicts grew. He suffered headaches, stomach aches, eyestrain, stiffness of joints, excessive

heart action, and other symptoms. Always self-conscious, his self-reference increased. He suspected others of talking about him, then of ridiculing him, and finally he expressed insistent delusions of persecution by instructors and by fellow students. These are all tension-reducing mechanisms designed to strengthen the sense of personal worth. But even to the individual who is driven to them, they provide only a small measure of actual relief, for they do not deal directly and effectively with the underlying adjustment problem.

Expansive delusions, or delusions of grandeur, are also means of ego-inflation and a defense against inferiority. The writer, conversing with a handsome, physically impressive man in a psychopathic ward, asked him why he was spending his time there. He replied that he was on a special secret mission, but was nevertheless willing to reveal that during the World War he had been commander-in-chief of the Allied forces at a fabulous salary. He asserted that all those about him were his assistants, and that when his present government mission was completed he expected to return to his family and take them on a round-the-world tour.

Delusional systems are logic-tight to their owners. They show a bland disregard for reality and for the validity of basic premises. They represent such complete evasion of real motives and conflicts that they are symptomatic of severe maladjustment.

ADJUSTMENT BY WITHDRAWAL

One way to escape conflicts is to retire to an environment (very frequently a mental environment only) where they do not exist. In a psychopathic hospital the writer once saw a young woman standing almost immobile. Her head had dropped dejectedly. Her arms hung limp at her sides. Her eyes were unseeing. The attendant spoke in ordinary tones, but was unheeded. Only by excessive stimulation could the insulation between the patient and the outside world be penetrated. This person, absorbed in her own delusional systems, represents an extreme case of withdrawal. Milder instances are probably different from this one more in degree than in character of the mechanism.

Seclusive behavior. To avoid fighting the battles of adjustment in a harsh competitive world, one may withdraw from social contacts. This seclusiveness frequently is the means of avoiding failure by refusing to meet the environment head-on. Parents and teachers often stimulate the retreat mechanism by unnecessarily severe punishment, repression, sarcasm, and ridicule. The school child who is not quickly incorporated in the group becomes more and more shy and seclusive. Teachers and parents should be particularly watchful for such cases, and aid these socially timid persons to win membership by contributions which elicit spontaneous approval of their fellows. The child's—for that matter, the adult's—social behavior must be successful and satisfying if it is to lead to continued growth.

Daydreaming. One of the commonest forms of withdrawal is resort to fantasy. Daydreaming, like dreaming during sleep, is probably a form of wish-fulfillment. Fantasy is not in itself a form of maladjustment. For instance, it is a means of projecting oneself into the future—it is one way of defining ambitions and goals. But when dreaming oneself into success and satisfaction becomes a habitual substitute for working oneself into mastery, it becomes a symptom of maladjustment. The school child, depressed by frequent failure, or just bored by apparent futility of its tasks, may escape into a comforting or a vital world of make-believe. The unsocial child may be the life of the party in her musings. In the dream-world one can lord it over teachers, parents, and the secretly envied fellow pupil. Inferiorities may be dissipated and superiorities established merely by the glow of imagination. Writers have identified the following types of fantasy: display, heroic act, grandeur, death or destruction of others, suffering hero, and conquering hero. The daydream softens life's sting, fulfills one's wants, solves one's conflicts, restores one's self-respect. Every community has its incompetent visionary, who plans great things but never does them—seldom ever begins to do them. This person frequently spends so much time in futile dreaming that his wife and family have to support him. The inveterate daydreamer and braggart are caricatured by the cartoonist in Major Hoople, a

comic figure of escape from the reality of acts and accomplishments.

Regression is another retreat from reality. When present difficulties are too intense, one may simulate a less mature level of behavior in which such problems do not exist. Or one may meet problems in a childish way. When adolescents or adults resort, for instance, to temper tantrums or pouting (which take a great variety of forms) to get their own way, they have reverted to infantile forms of behavior. Running with one's burdens to others is another case of regression. It is suggestive of childish dependence on parents, who usually have been all too willing to make the choices and decisions. Attention-getting devices such as loud and incessant talking, little tricks and grimaces, sarcastic comments or exaggerated statements, smack not a little of the egocentric tendencies of childhood. "Make me a child again just for tonight" is a wistful plea with which all of us sympathize when we tire of fighting and would sweep away the tensions by retreating to the simple ways of childhood. This, too, illustrates what Dr. F. B. Knight has called the "Old Oaken Bucket delusion," the tendency in adulthood to forget the tensions of childhood and to remember only its comforts and satisfactions.

Many a man tires of the struggle of growing, and turns to live on past laurels. The strong person is the one who adds constantly to his accomplishments. Beware the tendency to look backward often or long. Weariness and desire for comfort and peace are narcotics—to indulge in them too much is to acquire the habit of shirking the real job of living, the essence of which is struggle and victory.

This is not to say that a dynamic person cannot tolerate any regressive behavior. The wise man forgets his tensions by wholehearted participation in sport and play. Rod and reel and golfstick, tennis racket and volleyball, are useful objects with which to spend a leave from the front-line trenches. Other forms of leave are observable at fraternity reunions, football games, and homecoming activities. But the mature adult knows that he must soon cancel his own leaves, and hurry back to the real business of living.

ESCAPE BY AILMENTS

A devout member of a religious order once was registered in a summer session course in which her own emotionalized beliefs were not in accord with the instructor's philosophical point of view and the bias of the assigned readings. From about the middle of the term, the student was continuously absent. At the end of the term she came to the instructor's office to explain the absences. Her eyes had begun to trouble her early in the period. Words blurred or danced about on the page until she could not recognize them. At other times colored disks and streaks of light appeared in front of her eyes. She had finally, a few days before, gone to a specialist who had been unable to find any organic difficulty, or even any necessity of replacing lenses in her eyeglasses. A little discussion made the mechanism clear. To read the references was to disturb greatly her deep-seated religious convictions and doctrines. She had been unable to resolve the distressing conflict either by revision of belief, complete refutation of the reading, or objective consideration of the intellectual issues. But disturbances of vision made study impossible and escape from the conflict intellectually and emotionally respectable.

Hysterical behavior. It should be noted that in cases comparable to that above, although no organic basis for the physical malfunctioning may exist, the person is for all practical purposes ill. The simple malingerer is one who consciously and deliberately tries to deceive medical attendants and employer, perhaps, by exaggerating symptoms or by asserting the prolongation of symptoms actually relieved. In the case just described, however, the individual did not use disturbances of vision as a deliberately planned and conscious escape. Thus Morgan writes:

It is because the conscious self shrinks from the adoption of tricks that the unconscious mechanisms produce the symptoms we have described. The adoption of hysterical symptoms should never be taken to indicate that the victim has low ideals. If he had he would attempt trickery or any underhanded means to get what was desired. It is rather because he has high ideals that he finds himself confronted with an

impossible situation. The mechanism which comes to his rescue is always an unconscious one or he would not be an hysterical.¹

The resolution of a mental conflict by means of the adoption of some disease symptom, as indicated above, is called hysteria. Hysterical cases were common during the World War. Fear of battle led to intense desire to escape from active duty in the firing line or to avoid being returned to the front from the hospital. The soldier, feeling, however, that such motives were unworthy, had to adopt some mechanism which would accomplish his purpose and at the same time protect his self-respect. Illness or the prolongation of physical symptoms offered a solution of the dilemma. So real symptoms were often grossly exaggerated, and others adopted, such as convulsive attacks, paralyses, contractures, and anesthetics (loss of sensitivity).

Hysterical symptoms in children are often suggested by the illness of parents. A child was sent to the hospital suffering from slight fever, stiffness of the neck, pain in abdomen and limbs, with a tendency to contracture of leg muscles. She had refused food for some time, to the point of serious loss of weight. No organic causes could be located except a slight cold of no particular consequence. Investigation showed that the child's parents had been separated, that the father called to take his daughter riding, and that during those meetings he had tried to prejudice the child in his favor. The mother used equally unwise tactics to hold the youngster's affection. As in other instances of hysteria, this child's behavior was caused by the attempt to escape from a difficult conflict. The illness method was probably suggested by the mother, who complained frequently of the same symptoms, or possibly by previous successful real illnesses of the patient herself.

Sickness as a means of getting satisfactions, or of escaping from conflicts without too much self-derogation, is an indication of inability or unwillingness to analyze self in relation to environment. To prevent such maladjustments the child should learn to face his desires consciously, to treat objectively the limitations which

¹ J. J. B. Morgan, *The Psychology of Abnormal People*, p. 478. Longmans, Green, 1936.

reality places upon their satisfaction, and to make a conscious solution of the difficulty.

Vague fears and anxieties. Many fears are of specific objects, persons, or situations. Though many of them are irrational, and attributable to the effects of conditioning, i.e., to transfer from one feared situation to another which occurs with it, they may be managed fairly easily, for they carry no hidden meanings as evasions or failures in managing conflicts. Furthermore, it is probable that some fears are socially justifiable—they lead to survival value.

However, vague but persistent and intense worries and anxieties are more difficult to understand and eliminate, for they usually are extended to a great many situations, and obviously are methods of disguising what really is feared. The effect of these reactions on the efficiency of the person is pronounced. There is a persistent state of tension due to the perseverance of conflicts which are in no sense resolved by diffused emotion. This tension is evidenced by continued physiological changes characteristic of emotional states—accelerated heart action and breathing, digestive disturbances, increase in blood pressure, accentuated glandular activity, and possibly speech and other motor incoördinations. The victim is also irritable, or depressed, or excessively but futilely active, restless, inattentive, and exhausted. Queer compulsive acts such as peculiarities of speech, waving of the arms, and tics may occur.

What causes these reactions? Of what are such persons afraid? They may be afraid of failure, resulting from experiencing consistent defeat in efforts to satisfy their wants. This fear may also be induced by parents who set up standards of accomplishment inconsistent with the child's abilities. Many persons are worried by a persistent sense of insecurity. This frequently happened to college students during the depression when both students and parents often did not know where the next meal was coming from. Religious conflicts frequently cause young people no end of anxiety, the basis of which is seldom understood. Morgan ¹ mentions insecurity felt from failure to obtain from everyone the same solicitude expressed by overzealous parents, and that which may result from

¹ J. J. B. Morgan, *Keeping a Sound Mind*, chap. III. Macmillan, 1934.

sudden removal of affection frequently felt by the first child when another is born.

Insecurity in the family may be accentuated by bickering of parents or brutal punishment. Many children fear they are not wanted, or that they are living with foster parents. The frequency with which problem children come from broken homes testifies to the insecurity generated by divorce and separation, and attended by divided loyalties and competition of parents for affection and justification.

The fear of guilt is common to adolescence and adulthood, and ordinarily is the result of conflict of basic drives, often wholesome rather than harmful in themselves, and moral indoctrination. The writer once called on friends, who said their children had just gone to a Sunday movie, but they had not accompanied them, for their old teachings on the use of the Sabbath made them uncomfortable throughout the show. That they permitted their children to go indicates that they had no present scruples concerning the matter, but their hesitancy illustrates the persistence of emotional taboos in spite of intellectual assents.

The sense of sin is particularly strong when sex is concerned because of the intensity of the physiological drive and the rigidity of moral teachings on the subject. The practice of masturbation is especially likely to lead to feelings of guilt and fear of dire consequences. This emotional reaction usually serves not to inhibit the habit but to make it worse. When the adolescent is led to understand the nature of this aberration as an infantile response, and a means of turning the personality in upon itself, rather than as an act which in itself is sure to lead to severe physical and mental consequences, the habit is usually very much weakened, and may entirely disappear.

Young people are also frequently disturbed by sexual reveries against which they cannot seem to assert their will. In sexual, as in many other fears, the substitution of information for superstition is usually therapeutically helpful, and the absorption of the individual in overt, wholesome recreation and social contacts the most valuable form of adjustment. The sexual drive must at the

same time be understood, and conscious means adopted for its management.

Where unfortunate incidents have occurred in the individual's life, there is no point in continuous morbid self-opprobrium. The need is for conscious and objective evaluation (this can frequently be promoted by counsel with another person who can look at the matter externally) and for deliberate proposals for future readjustment.

PRINCIPLES OF EFFECTIVE ADJUSTMENT

In the formulation of constructive principles for the management of the "problems of the person," the first fact to remember is that ineffective responses to problems and conflicts in living are learned reactions. It is possible to learn to fight, as well as to retreat, to meet issues instead of running away from them, to face the facts instead of deceiving oneself. The basic behavior principle to remember is that we learn those responses which reduce tensions and provide satisfactions. The goal is to learn to satisfy needs by direct action on the environment in a setting of conscious objectification of internal and external forces. From these basic points of view, what are some of the criteria of effective adjustment?

1. *Personality management is self-management.* The responsibility for handling oneself in one's world cannot be delegated to parents, teachers, or society without attendant atrophy of the person. In fact, "person status" cannot be attained at all except by the gradual but progressive psychological weaning of the individual from the dominations and protections of parents whose function is to care for him during his immaturity. What many parents forget is that maturity—essential self-dependence—cannot be achieved by decree, by passage of time, or by arrival at chronological manhood. The attainment of adult stature in personality is a process of growth, not one of sudden transformation. Parents often keep children dependent upon them by oversolicitousness, which leads to timidity and fear of aggressive contact and self-projection. Parental domination curbs initiative, thwarts training in making choices and taking consequences, destroys self-confidence and feelings of

personal worth. Such subjugation of the child usually results in social immaturity and frequently in inadequate heterosexual relationships in adolescence and adult life.

It is a safe rule never to do for the child what he can do for himself. Children get real satisfactions in doing things for themselves, and these tendencies should be constantly nurtured. How often have youngsters been heard to say, "I want to do it myself," or "See, I can do it."

Selfhood comes from the cultivation of initiative and of self-dependence. To keep children in the nest long past the flying period is to do them severe injustice. Every college administration is nettled by fathers and mothers who cannot realize that their college-age children should be fast completing the process of psychological weaning. These parents insist on constant visits home, and otherwise try to postpone adult relationships with their children. Men and women of college age still need the counsel of elders and should maintain loyal ties with the home. But they must also be ready to assume self-responsibility. They cannot enter a vocation, or accept the responsibilities of marriage, as dependent children. College students who still find themselves immature will do well to take steps to wean themselves as gradually and wisely as may be, with due consideration for the growing pains of fathers and mothers who may think they are being dispossessed.

Intellectual and educational dependency is just as unfortunate among college students. It is expressed in retreat from controversial and difficult problems, dependence on specific textbook assignments and juvenile reliance on daily recitations, inability to work out problems independently, timidity in expressing reasoned convictions, naïveté in accepting uncritical dogmas, and desire to have teachers provide all the answers. This attitude is probably a hold-over of earlier school experience in which the teacher, not the pupil, took responsibility for learning. It is a result of failure to follow the maxim, "The student is not an invalid, and the teacher is not a nurse." Students who need to grow up intellectually should think through to educational purposes, and begin actively to assume responsibility for their attainment.

Self-management means also the practice of self-analysis. The individual must recognize his motives and conflicts for what they really are, and plan defensible means for satisfaction and solution. The truly sophisticated person is the one who knows just what he is about.

2. *Other persons may aid in objective analysis of difficulties.* The individual should stand off and look at himself as dispassionately as possible. But this is always difficult, and the assistance of a friend or confidant in objectifying one's problems may be desirable.

The "confessional" is a psychologically sound means of reducing tensions. The process aids in the identification of motives, the evaluation of difficulties, and the attainment of perspective. Exaggerated effects are often deflated by discovery that others have experienced the same conflicts. But it must be remembered that confessing may also become a means of escape, a form of dependence, or a mode of ego-inflation. Some persons confess as constantly as others talk about their operations.

3. *Meet life with zest and enthusiasm.* "The person for whom life is not moving along, for whom the day is all too long, is maladjusted. Boredom is a dangerous affliction. Life has a meaning; find it. Over-cynicism is itself some evidence of poor adjustment."¹

4. *Avoid overemotionalizing experiences.* "Life is one thing after another, and we should be willing to recognize passing on to the next and next thing. One's self and his world should not be taken too seriously. We should not be too joyous over our joys or too worried about our worries." The well-adjusted person can laugh at himself.

5. *Set up a plan of well thought out, consistent goals.* Then translate these objectives into the steps necessary for ultimate attainment. Mastering each of the more immediate but instrumental tasks will sustain and increase interest, elicit well-directed energy, and create zest for further accomplishment. Nothing succeeds like

¹ This quotation and those which follow are from F. B. Knight and T. R. McConnell, *Syllabus for a First Course in Educational Psychology*. Williams Iowa Supply Company, 1936.

success. Knowledge of progress is a remarkable tonic to the personality.

6. *Develop interests, appreciations, and abilities in reading, music, art, crafts, games, and sports.* Most young people do stupid things because they don't know what else to do. Leisure time activities are means of self-expression; they offer acceptable means of escaping from the overreal world, of "letting down" for brief intervals.

7. *Plan to compete and to succeed on your own level.* This demands an evaluation of capacities and special aptitudes. Don't think you have any more ability than you do; don't admit any less. Use self-analysis, experience, and objective measurement through the psychological clinic to find out. Come to terms with yourself; put all the cards on the table.

8. *Learn to live in the world as it is.* "There is less emotional strain in 'keeping in step' than in 'running through the red lights,' in belonging to the group rather than in being guided by a set of opinions which run across group values and group conventions. Thus, belong to the group—do as others do—except when this involves too great a price in terms of other real (not semi-neurotic) values."

This last qualification is important. It is often too easy to take on group mores which are undesirable. The individual, in defense of values, may have to run counter to demands of the group or merely withdraw from it. But one should do so with full intention to pay the price without whimpering or clothing himself with the tiresome virtue of the prude, the goody-goody, or the overprecise.

9. *Compromise is an excellent technique.* "Do not expect to beat the world. Do not allow the world to defeat you. Compromise with it. One's compromises become habits. Hence, the careful planning of what compromises to make is important."

10. *Decide that living is struggling, and learn to like it.* "Life is fighting; one becomes either an attacker or a retreator."

11. *Treat sex as you would any main problem of living.* Although sex is probably not (Freud to the contrary notwithstanding) the most compelling of human motives, it complicates man's life enormously. But sex is a dynamic and natural aspect of human nature,

and we long since repudiated the medieval doctrine that original nature is inherently depraved. Find out about sex; don't merely morbidly brood over it. Your impulses are little or no different from those of others. Don't suppose your adjustment problems in this field are unique. Put fear aside with scientific information and the application of common sense. Ask your instructor in psychology for help in finding this information.

12. While you are trying to preserve the dignity of personal worth, *try to create conditions favorable to the personal worth of others*—your classmates, your friends, your younger brothers and sisters, other children in the community, and ultimately your wife and children.

13. *Keep your attack on the world unified and consistent.* Beware of conflicting loyalties and goals. Bring about order—an orderly balance of motives and satisfactions, an internally consistent set of values, a harmony of means and ends. Self-deception is disintegrating, for it separates personality from reality. Unity and order are based on full insight concerning the self at all times. Make the experiences of life fit a pattern. When parts won't fit because they really are incongruous, don't fear to recognize the discrepancy, and then plan for future readjustment. Never try to keep the right hand from knowing what the left hand does. The personality, like the Union, cannot exist half-slave and half-free. All behavior must conform to one set of standards. True discipline and caprice cannot exist side by side.

Understanding ourselves promotes the understanding of others. One will be less often critical, condemnatory, scornful, or resentful of the behavior of others if he attempts to understand it as motive-satisfaction. It will be fruitful in the next chapter to undertake a systematic study of the motives which energize the behavior of human beings.

QUESTIONS

1. Give an illustration of the fact that several motives usually are involved in any adjustment.
2. Explain how adjustment ordinarily involves delayed action.

3. What attitudes, habits, and abilities does the individual need to develop in order to acquire a relatively high level of adjustability?
4. What part does learning play in the process of adjustment?
5. To what extent must the individual learn to tolerate thwarting?
6. Is it essential to learn to adjust to failure as well as to success?
7. Discuss means of training individuals to make direct and effective attacks upon their difficulties. Is problem-solving in school situations and life activities an ability which develops successfully apart from training?
8. What are the implications for the curriculum of the problems discussed in this chapter?
9. Do you think self-deception or keeping the real facts from others is the key to maladjustment?
10. Show how it is often impossible to infer the nature of an underlying conflict directly from the subject's behavior.
11. Explain how it is possible to give the superficial appearance of aggressive attack on a difficulty without really doing anything about it.
12. What is the difference between *hysterics* (a popular term) and *hysteria* (a psychological term)?
13. Show how characteristic habits of adjustment are the product of a long process of training and experience.
14. Has this chapter emphasized the constitutional or the learned factors involved in adjustment?
15. Most normal persons have used one or more of the adjustment mechanisms discussed in this chapter with greater or less frequency. Which ones have you used recently?
16. Write up one or more case studies illustrating the ineffective forms of adjustment discussed in the text.
17. Write up one or more case studies illustrating the use of intelligent and effective means of dealing with conflicts and problems which call for adjustment.
18. Can you find in fiction or in biography examples of people who have solved their adjustment problems wisely?

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CHAPTER VI

HUMAN MOTIVATION

THE WHY OF BEHAVIOR

Why will the same individual shirk all his course assignments but work tirelessly on the construction of a radio transmitter, or read unassigned books by the hour, or spend every available minute writing for the college newspaper, or "live football" in and out of practice?

With coöperation of officers and members of a college fraternity, experimenters¹ were able to persuade ten freshmen pledges that their scores on certain addition tests would be the final criterion for acceptance or rejection by the fraternity. These students were "hazed" by the members for a week and permitted to sleep only two hours each night. At the end of this period, they were given the tests at 10 P.M. An equal number of junior students of the same ability were given the same tests under favorable conditions at 8 A.M. and told merely to make the best scores possible. The freshmen made a score twice as high as that of the juniors in five minutes of testing time. One wonders what quality and amount of achievement might be stimulated if students were as strongly motivated in academic tasks as they frequently are in extracurricular and social activities.

To explain behavior is to search for motives. The subject of motivation deals with the why of behavior—for instance, why individuals at given times attend to certain stimuli rather than others, do certain things rather than others, strive for certain goals rather than others, and from time to time expend widely varying amounts of energy on their activities. Motives are sought when such ques-

¹ F. B. Knight and H. H. Remmers, "Fluctuations in Mental Production When Motivation is the Main Variable," *Journal of Applied Psychology*, vol. 7 (September, 1923), pp. 209-223.

tions as the following are asked: Why did I come to college? Why do I take delight in the discomfiture of my neighbor? Why did I decide to wear a brilliant necktie? Why does Student A undergo so much privation to stay in college? Why does my father still treat me as a child? Why did I go without breakfasts for a month in order to buy the newest collegiate jacket? Why does Professor X browbeat the timid students in his classes? Why does B brag and bluster? Why does C study while the rest of us play? Why do parents sacrifice so greatly to send sons and daughters to college? Why did Jane Addams devote her talents so whole-heartedly to the work of Hull House? Why do men devote their lives to making fortunes? Would invention and economic enterprise stagnate if private profits were sharply limited and the balance of return diverted to social purposes?

The previous chapter described man as a dynamic, striving, purposive organism whose behavior is to be interpreted as the means of satisfying basic wants and needs. It is now desirable to study man's "springs to action"—his motives—more systematically.

The "*reaction hypothesis*." The psychologist has found it fruitful to study human behavior by identifying, on the one hand, the reactions made by an individual, and on the other, the situations to which these responses are made. The ultimate purpose of this analysis is to control behavior (1) by evoking certain reactions through presentation of proper stimulus situations, (2) by withholding certain stimulus situations and thus making reactions unlikely to occur, and (3) by shifting the response from one situation to another not previously capable of evoking that behavior. This sort of human engineering is based on the reaction hypothesis, which asserts that:

. . . all forms of human behavior, whether muscular activities, such as grasping, walking, and speaking; glandular activities, such as secretion of tears, saliva, or bile; or mental activities, such as seeing, hearing, becoming afraid or angry, recollecting, or imagining, are reactions to definite stimuli.¹

¹ A. I. Gates, *Psychology for Students of Education*, p. 31. Macmillan, 1930.

Does the external situation alone determine behavior? But the stimulus-response description of man's behavior omits an extremely important aspect of the process. What situations an individual reacts to, and what ones he disregards; what reactions he makes; what responses he eliminates during repetitions of the stimulus situation and what ones he selects and incorporates into a behavior pattern, are determined in large part by what man is. This means that behavior is determined by what his original nature is, and also by what his experience has been. What man will attend to, and what he will do to situations depends upon his physiological and psychological needs, upon his goals and purposes, his mental sets and dispositions. To substantially the same situation at two different times, the individual may make two different reactions, for at these times the individual is different. Thus, to the presence of food, the individual when satiated will not make the same responses that he will when hungry. With these facts in mind, Woodworth¹ substitutes, for the familiar $S \rightarrow R$ symbol of the behavior sequence, $S \rightarrow O \rightarrow R$, in which O represents the organism that is reacting. Woodworth expands the expression again to read $W-S-O-R-W$, meaning that "the environment (W) acts on the individual by stimuli; the stimuli arouse the individual to responses characteristic of himself; these responses change the environment; they also change the individual himself." It is the dynamic tendencies to action of this O that we are concerned with in this chapter.

EXPLANATIONS OF MOTIVATION

Instincts and motives. It was long customary among psychologists, and still is among laymen, to assume that human motivation was grounded in a set of inherited behavior patterns called instincts. The instinct of mother love supposedly evoked protective care of children. The instinct of pugnacity dictated a fatalistic attitude toward war. The doctrine of laissez-faire in economics was validated by such instincts as competition, acquisitiveness, and self-preservation. Other instincts frequently identified were gregari-

¹R. S. Woodworth, *Psychology*, pp. 7-9. Holt, 1935.

ousness, sympathy, rivalry, curiosity, imitation, self-assertion, submission, construction.

It was common for those who believed in the reality of instincts to place them between reflexes and general inborn capacities in classifications of innate behavior. The distinctions between these categories were primarily those of specificity, complexity, and modifiability. Reflexes are the most specific in form, simple in mechanism, and fixed in nature, and represent behavior which results when the nerve impulses traverse relatively simple routes from receptor (sense organ) to effector (muscle or gland). Withdrawal after painful stimulation, the pupillary reflex to light, sneezing, coughing, grasping, and extending fingers, are examples of reflex acts. An instinct was said to be more complex and less localized behavior involving an adjustment of the whole organism, somewhat more variable, and more susceptible to modification in pattern through training. By definition, however, the instinct behavior pattern had to be specific and predictable enough to be described and classified. Furthermore, because the instinct pattern was said to be unlearned, it was necessary to assume that the neural structure necessary for execution was laid down in specificity and completeness, so that when an adequate stimulus-situation occurred, and a sufficient amount of growth or maturation had taken place, the reaction followed automatically. Inborn capacities were thought of as the broad constitutional backgrounds of general abilities and special aptitudes which condition the effects of training and experience.

There are many lists of instincts, among which McDougall's is one of the best known. Illustrative of his list of eighteen innate "propensities" (a word he has substituted for *instincts*) are the following:¹

To seek (and perhaps to store) food (food-seeking propensity).

To court and mate (sex propensity).

To flee to cover in response to violent impressions that inflict or threaten pain or injury (fear propensity).

To explore strange places and things (curiosity propensity).

¹ W. H. McDougall, *The Energies of Men*, pp. 97-98. Scribner, 1933.

To feed, protect, and shelter the young (protective or parental propensity).

To remain in company with fellows and, if isolated, to seek that company (gregarious propensity).

To domineer, to lead, to assert oneself over, or display oneself before, one's fellows (self-assertive propensity).

To defer, to obey, to follow, to submit in the presence of others who display superior powers (submissive propensity).

To acquire, possess, and defend whatever is found useful or otherwise attractive (acquisitive propensity).

Objections to the doctrine of instincts. Many objections have been raised to the traditional doctrine of instincts, and some psychologists have repudiated it entirely. The impossibility of distinguishing the learned from the unlearned in an organism which is in constant environmental relation has been pointed out. To the biologist, "characteristics do not fall into two mutually exclusive classes, one hereditary, the other environmental."¹ Psychologists have also come to recognize the futility of trying to draw a sharp distinction between instinct and habit. There is excellent reason to believe that many so-called innate behavior patterns listed by some writers are in fact habits. Although we long assumed that, by original nature, children were afraid of the dark, it would now be generally agreed that this is a conditioned or learned fear reaction, not an innate one.

The great discrepancies among lists of instincts suggest that different writers are really identifying habit patterns which have had a basis in original general tendencies to behavior but which have become so overlaid and specific that the underlying core cannot be defined and delimited. Bernard,² for instance, found more than 14,000 instincts listed by one or another of the several hundred accounts of native behavior which he analyzed.

Very careful observers have described a relatively large amount of variability or regulatory behavior (adaptations of response to

¹ H. S. Jennings, *Biological Basis of Human Nature*, p. 133. Norton, 1930.

² L. L. Bernard, *Instinct*. Holt, 1924.

variations in stimulus pattern) in the reactions which many writers had classified as instinctive. To account for this variability in detail, those who hold the instinct doctrine would have to posit the appropriate innate neural structure. Altogether, this demands such a complexity of inherited neural organization that, for reason of this improbability alone, the doctrine is open to serious question.

Motives as general tendencies to behavior. The most sensible position in the debate over instincts seems to have been taken by Schoen. He points out that there is "instinct" (that is, a core of native tendencies) from animals to man, but there are not "instincts."¹ In animals native behavior is more specific and invariable, and much less susceptible to modification by experience. This is in large part responsible for the relative fixity and unadaptability of lower forms referred to in the discussion of adjustment in the previous chapter. Native behavior in human beings, however, is much more general and modifiable, and Schoen believes that it should be described in such broad terms as withdrawing or approaching tendencies which underlie the manifold specific responses by which the adjustment is carried out, and which are mainly learned reactions. "In man," Schoen declares, "native behavior is most variable, being present as a *general tendency to behavior*, the specific form that the tendency ultimately assumes being not only influenced, but *determined* by environment and training." From the same point of view, Schoen writes that although the doctrine of instinct has been utilized to justify wars, industrial strife, and social and political aggrandizement, in fact:

Human beings love nothing by instinct and hate nothing by instinct, but acquire their likes and dislikes in a subtle but nevertheless detectable manner. A child can be taught to hate or to love any person or object, and it can be turned either into a pugnacious or peaceful creature, depending on how and where it is reared. Mother love is no more an instinct than is love for one's country or family, a painting, or a house. The movement for the abolition of war is not an attempt to eliminate

¹ Max Schoen, "Instinct and Man," *Psychological Review*, vol. 34 (March, 1927), pp. 120-125.

or suppress a pugnacity instinct by intelligence, but to change vicious and destructive social habits into constructive ones.¹

Drives. These general instinctive tendencies to behavior, or characteristic trends in human nature, are commonly called drives, a term which expresses the dynamic nature of the organism. The several senses in which the term is used are well defined as follows:

What is drive? In the physical sense, drive is the energy which makes the machine go. In the behavioral sense, drive is goal-oriented behavior, or else the general level of activity whether purposive or not. In the physiological sense, drive is a tissue condition which gives rise to persistent stimulation, or else drive is the persistent stimulus itself. In the strictly psychological sense, drive is a motivating factor of personality—such as a wish, purpose, ideal—which regulates and directs one's conduct. Human and animal activity contains countless goals and hence innumerable drives.²

There is a well-identified set of drives which depend upon persistent organic states, such as hunger, thirst, sex, the need for rest when weary, and those concerned with regulation of bodily temperature. The activities which result tend to persist until the physiological tension is, for the time being, removed. These organic drives, however, cannot account for the complexity of human motivation. This inadequacy has led to the attempt to identify other basic needs, often called "secondary" to distinguish them from those definitely dependent upon physiological conditions.³ Lists of secondary drives, or needs, differ materially. One reason is that the motivations of human beings are greatly complicated by learning. While one cannot think of a list of secondary drives as "innate," it is profitable to consider certain motivations which are powerful determinants of behavior. The list which follows is one of many which might be given.

¹ Max Schoen, "Instinct and Intelligence," *Psychological Review*, vol. 35 (March, 1928), pp. 161-166.

² Reprinted by permission from *Motivation of Behavior* by Young, published by John Wiley & Sons, Inc., p. 84.

³ *Ibid.*, pp. 154, 155.

1. *Desire for new experience.*¹ The human organism does not merely wait to be bombarded by stimuli; it seeks stimuli. It craves expansion, adventure, new sights and sounds, new experiences, active participation. Human beings seem to be interested in activity for its own sake. They take joy in the "sheer satisfyingness of mental control," as well as in overt activity. Curiosity and exploratory behavior are probably closely related to the desire for new experience. How unfortunate that education so often serves to dampen and inhibit rather than to stimulate curiosity and exploration. Although it probably is not wise to speak of an "instinct of workmanship" or a "creative instinct," interest in accomplishment and creative effort are probably based upon elaboration and direction of the basic craving for new experiences. Man is plagued by monotony and intrigued by variety and shock.

The desire for active experiencing may be the result of a surplus of energy left over after the primary organic needs are satisfied, and tending to seek release in overt activity and mental behavior. Consider in this connection how desirable it is to take advantage of the manifold resources of an educational institution in acquiring interesting and worthwhile ways of spending purely leisure time. These opportunities, of course, should not be heeded as a duty but in the spirit of searching for sheer enjoyment. Sports; games; musical activities; such crafts as printing, bookbinding, leather-working, jewelry-making, and weaving; photography; collecting; wood-working, and all manner of fascinating hobbies provide outlets for man's craving for activity. Educational institutions would do well to make a great variety of these experiences available to all students. One should include in any list of leisure activities purely intellectual interests. Deep-seated interests in learning sustain and stimulate activity for a lifetime.

2. *The desire for security.* To be wanted and to be loved are among the most powerful of human cravings. The growing child thrives under a sense of protection and care, and with the assurance of permanency of the family relation and the certainty of satisfac-

¹ The first four motivations in this list are adapted from W. I. Thomas, *The Unadjusted Girl*, chap. I. Little, Brown, 1923.

tion of its basic needs. The deeply disturbing sense of insecurity, on the other hand, arises from uncertainty, instability of the conditions of life, lack of affection, disruption of family relationships, and fear of future status. Oversolicitousness on the part of elders and undue emotional dependence between children and parents, however, may easily hinder the attainment of maturity and self-dependence.

Adults, too, need a reasonable degree of security. In a recent political campaign, one party purported to offer "security," and the other "opportunity," as if the two were incompatible. The truth is that man must feel secure, but not too secure. It is difficult to know where this balance lies. Too much security often leads to overdependence and stifles initiative and self-assertion. The adult who is too freely cared for by others can soon revert to childish immaturity. The problem is to extend security through guarantee of opportunity (which does not follow automatically upon party platform promises) and to protect the individual against ravages of conditions not within his control. This is not too much security, for it demands self-dependence and stamina. It is the fear of conditions beyond its control (which are numerous in the modern age) that inevitably damages human personality.

3. *The desire for a feeling of personal worth,¹ and the need for social approval.* Many illustrations have already been given in Chapter V of the ends to which man will go to save his self-respect, to establish his worth in his own estimation, and to resist the deflation or mutilation of the self. Human beings not only must convince themselves of their importance; they crave the prestige which comes with social recognition. These wants are closely related to the urges to excel, to succeed, to win over others, to overcome obstructions, to master and control. Man will go to great effort to get attention, sympathy, and commendation.

The desire for social approval probably leads to efforts to conform to social mores and to the standards of preferred groups. College students prize highly—and probably unduly so—membership in

¹ This phrase is used by Wendell White, *The Psychology of Dealing with People*. Macmillan, 1936.

social and professional fraternities. Membership is evidence of acceptability and superiority. New students strive to adopt campus customs quickly in order to "belong." This effort to conform and adapt probably often leads to an unfortunate loss of individuality and to undesirable solidification of group behavior.

The worst fate of human beings is to go unnoticed. Certain disregarded persons in small communities may welcome sickness in the family because it is noted in the local items of the village newspaper. Minority groups on college campuses are often overaggressive in demanding their rights and insisting upon redress for imagined grievances, as a means of securing attention. It is more satisfying to be disparaged or persecuted than to be ignored.

4. *Man tends, in the opinion of some psychologists, to react with affection, love, friendship, and sympathy for others.* These motives are supposedly the basis of altruistic behavior. It is very difficult to know whether these are really original tendencies or conditioned reactions built upon more native drives through forces of social approval and conformity. In any event, the mature person enters into marriage relations, for instance, not only for self-satisfaction but also to contribute to the needs of his mate. Whether or not altruistic behavior is founded upon more basic selfish motives, man does in many instances act for the social good as well as, or at times even instead of, for direct personal benefit.

5. *Desire for effective effort*, "for doing something that has an outcome and doing it for the sake of the outcome."¹ This motive stresses the importance of goal sets and goal attainments. In its light, also, accrues the significance of the finding that elementary school children were less interested in narrative reading material than in that which resulted in a "consecutive series of doings." This motive is a warning against the prescription of tasks which to the learner are futile. The reason why the extracurriculum nearly swamped the curriculum is that the marginal activities were significant to the participator. Extracurricular activities were in the form which made them real, integrated, complete, and worthwhile. They encouraged creativity, purposing, planning, executing, and

¹ W. C. Trow, *Educational Psychology*, p. 34. Houghton Mifflin, 1931.

evaluation of results. And so of late, through projects, problems, and activity units, elementary and secondary schools, and occasionally colleges, have capitalized these dynamics of learning in the classroom.

"Boondoggling" is a term used to describe employment on government projects which are considered silly, purposeless, and futile. Economic conditions are such that it will probably be necessary for the government to continue to employ large numbers of men. If so, zest for work and a feeling of dignity in the doing should be, and can only be, stimulated by socially valuable enterprises.

6. *Desire for order.* Trow¹ believes this drive is manifested in the arrangement of objects in the environment, in the order of government, and in artistic appreciation. It is also deeply characteristic of the personality itself. The human organism is at all times an organization. There is a "more than," an organizing relation, which dominates the parts and in fact determines in large degree their character. The normal mind is the integrated mind, which is manifested in balance and consistency of motives, in coherence of action, and in unity of ideals. The person resists forces which would splinter, or mutilate, or deprecate, this integrity. Some individuals, unable to reconcile certain desires or acts with the remainder of experience or a set of ideals, try to avoid disorder by pushing these things out of sight and out of mind. These dissociations may later be expressed in disguised form, the less to disturb the equanimity and unity of personality. Thus hallucinations (interpretation of an imaginal process as a sensing of actual objective conditions, or such a gross misinterpretation that it bears little relation to the actual situation present to sense) or delusions (false beliefs) may be developed to explain or rationalize the disturbing conditions. Hysterical paralyses may occur. Peculiar behavior may be resorted to as a blind. In severe cases, there may be a division of personality sufficient to be described as dual or multiple personality. In such instances, the individual shifts from one personality to another, and is frequently unable to remember in the primary form what tran-

¹ *Ibid.*, p. 36.

spired in the other, although memory for the principal manifestation is possible in the secondary phase.

All persons are somewhat inconsistent in behavior. Children may be honest in one situation and dishonest in another. The same individual may be assertive in one group and submissive in a second. It is difficult to direct energy always in ways which contribute to main objectives. But only the weak are buffeted about by every wind that blows. The strong can hold direction against head-winds and side-winds. The acts of ineffective persons are scattered and disintegrated; those of effective individuals are organized toward well-conceived objectives. Growing should be a process of attaining progressively better integration of those factors which control behavior.

Negative motivations. A distinction is sometimes drawn between positive and negative motivations. Leeper¹ lists the following negative ones: fear; anger, hate, or destructive or aggressive impulses; sense of guilt; feeling of inferiority; disgust, or feeling of repugnance. He believes that positive motivations dominate in healthy personalities and that negative ones are too often appealed to as a means of social control. To impress upon a young child a feeling of guilt out of all proportion to the seriousness of his behavior may develop unfortunate fears which persist into adulthood. It is probable that social and personal benefit follow most surely from the operation of positive drives in oneself, and from appeal to positive motivations in others.

Motives as distresses. Somewhat different from the usual treatment is that which identifies man's principal motives with the "dominant human distresses."² This theory treats stimuli as irritants which disrupt the organism's relative equilibrium or disturb its satisfying state of affairs. When its equilibrium is disrupted, the organism acts, directly or indirectly, to restore balance. The behavior of a satisfied organism is effective primarily for the maintenance of its present state of affairs, not for the invention of new

¹ R. W. Leeper, *Psychology of Personality and Social Adjustment*, p. 16. Cornell College, 1937.

² H. L. Hollingworth, *Educational Psychology*, pp. 91, 92. Appleton, 1933.

ways of acting. Learning thus waits upon dissatisfactions and distresses. Human beings learn, from this point of view, when they need to learn, when they are driven to learn.

For example, the student may be unconcerned about his language deficiencies until a badly composed letter is responsible for his losing a good position. Another may be almost proud of bad manners until his discourtesies alienate his sweetheart. A pre-medical student may be undisturbed about poor scholarship in the basic sciences until he finds that this seriously handicaps him in later professional training. The instructor may continue thumbing his old lecture notes until enrollment in his courses drops alarmingly.

Some of the distresses which evoke behavior are organic in nature. Others are more nearly related to the secondary drives previously discussed. One of the exponents of the theory under consideration lists "distresses arising from insults to the self." A portion of his analysis follows:

1. Situations are distressing that induce humility and shame, which lower the status of the self as observed below its status as conceived or expected.
2. Situations are distressing that put the individual at a disadvantage as compared with others of his class.
3. Situations that interfere with, obstruct, or frustrate the habitual or spontaneously initiated activities of the self are resented.
4. We resent acts and circumstances that seem to infringe upon the recognized or supposed rights and privileges of the self.
5. The spectacle of other selves being given greater privileges, or enjoying greater freedom or resources, is disagreeable.
6. We rebel at dictation of the self by other selves, even under circumstances logically justifiable.
7. We resent acts and remarks by others that show a discrepancy between the self as pictured and the self as apparently conceived by others.
8. We are annoyed by loss of functions, resources, and privileges long considered as identified with the self.
9. Threats or dangers directed against the freedom, the persistence, or the security of the self are dreaded.
10. We dislike to have the self ignored by others, even if there is no active aggression or threat.

11. Uncertainty or conflict in one's own concept of himself is painful.
12. Threat or danger to others who hold the self in high esteem or have contributed towards its well being is also distressing.¹

The specific ways in which the organism deals with its distresses are mainly learned. Out of the many reactions (some of them characteristic, many of them of the sort called "trial and error") which may be evoked by annoying stimuli the ones which serve to remove the irritants, to resolve the tension and restore equilibrium, tend to become connected with the stimulus-situation. With consecutive occurrences of the stimulus-situation, the successful tension-reducing response pattern tends to follow more quickly and surely, until it is finally "learned." The reader should stop to consider the mechanisms outlined and illustrated in Chapter V in the light of this discussion.

The importance of goals. For greatest effectiveness, it is not enough to release energy and initiate activity. The most useful stimuli not only create tensions but also give direction to behavior by establishing goals. The goal has been defined as "whatever object or situation at the time relieves the most tension, or best balances the tension."² Purposes are consciously projected goals, or end results. They may be objectively perceived—that is, the end result may be actually seen in concrete form—or they may be constructed in imagination. They may also be verbalized, as an individual states his intentions. It is really these goals, purposes, and ideals, these anticipated satisfactions, which are the dynamic factors of human motivation. These goal sets are grounded in original nature, for ultimately they are the means of satisfying man's deepest organic and psychological needs. They are also the product of learning, for with experience and insight, man develops a tremendous repertoire of wants not implicit in his original nature, but necessary and desirable in civilized society.

Goals must be attainable. The more definite the goal, the more economical and energetic is the behavior directed toward its at-

¹ *Ibid.*, pp. 91, 92.

² R. H. Wheeler and F. T. Perkins, *Principles of Mental Development*, p. 273. Crowell, 1932.

tainment. Goals should not be so distant or difficult that their attainment is too long deferred. It is true that the ability to forego immediate pleasure for ultimate satisfaction is one measure of maturity. Nevertheless, awareness of progress toward the final objective is necessary to sustain interest and effort. For this reason, it is wise to outline the steps which one must take to reach the goal. It often shortens an automobile or train trip to divide it into convenient sections marked off by key cities and towns. To check off the mileposts as they are reached is an effective way of sustaining interest and effort over long periods. Tasks which are means to ends are significant; the identification of these means-end relations is crucial to motivation and to learning.

Many activities which originated as means of removing distresses or of attaining goals become ends in themselves. To continue these activities becomes a source of great satisfaction. Many of man's interests and motives develop in just this fashion. For example, a student may take a course in geology to meet a requirement, and find it so interesting that he continues to study earth science as a hobby. The artisan may come to take as much pleasure from his workmanship as from the money for which he sells the product. A teacher may begin a program of research primarily as a means of securing promotions, but finally become so much interested in it that he is relatively unconcerned about position or salary.

The pursuit of literature, the development of good taste in clothes, the use of cosmetics, the acquiring of an automobile, strolls in the public park, or a winter in Miami, may first serve, let us say, the interests of sex. But every one of these instrumental activities may become an interest in itself, held for a lifetime, long after the erotic motive has been laid away in lavender. People often find that they have lost their allegiance to their original aims because of their deliberate preference for the many ways of achieving them.¹

RESEARCH ON INCENTIVES

Incentives may be defined as environmental factors related to motivation. Common incentives are the presence of a group, coöper-

¹ G. W. Allport, *Personality*, p. 197. Holt, 1937.

eration, competition, praise, reproof, reward, and punishment. Some of the research on the effects of these factors on human subjects will be presented below. It is difficult to interpret the experimental results, for although the external factors have been fairly well defined, the investigators seldom gave data on the manner in which the subjects interpreted, or reacted subjectively, to the environmental conditions.

The presence of a group. Although the experimental results are somewhat ambiguous, the presence of others seems, in general, to increase the quantity of work accomplished, but the quality often suffers.¹ In one experiment² the subjects were asked to record free associations (in one case they were instructed to write every fourth word that occurred to them) to a stimulus word at the top of a sheet of paper. They worked alone and in groups of five at a table together. Although the results were not entirely uniform, they indicated that the presence of others working at the same task tended to increase the speed of associative response. When other subjects were instructed to refute ideas presented in selections from Epictetus and Marcus Aurelius, a greater variety of arguments resulted from group working conditions, but more superior ideas occurred when working alone. In another study,³ however, stutterers produced more associations when working alone than in groups. Thus, the effect of a social situation differs with the characteristics of the subjects and the way in which they react to the others present.

Coöperation and competition. Will working for oneself elicit greater achievement than working for one's group? An affirmative answer to this question was suggested by an experiment with college students.⁴ Three equivalent groups of equal ability were

¹ M. A. May and L. W. Doob, *Competition and Coöperation*, p. 33. Social Science Research Council, Bulletin No. 25, April, 1937.

² F. H. Allport, "The Influence of the Group upon Association and Thought," *Journal of Experimental Psychology*, vol. 3 (June, 1920), pp. 159-182.

³ L. E. Travis, "The Influence of the Group upon the Stutterer's Speed in Free Association," *Journal of Abnormal and Social Psychology*, vol. 23 (April-June, 1928), pp. 45-51.

⁴ V. M. Sims, "The Relative Influence of Two Types of Motivation on Im-

formed for two experiments, one in word substitution, and another in speed of reading. In each experiment, one group was used for control; the second group was divided into two equal subgroups which competed with each other as groups; the third group was also divided into two subgroups, but in this case each student was paired with a rival in the other group. In the second and third main groups the scores each day were given for the paired groups and the paired individuals, respectively. In the substitution task, the control group improved approximately 102 per cent, the group motivation group, 110 per cent, and the individual motivation group 158 per cent. For reading, the percentages were approximately 9, 15, and 35.

School children from grades five to seven also made more progress when working for individual rather than for social gain.¹ Although it is generally accepted that children in American public schools work more efficiently under competitive than under coöperative conditions, the evidence cannot be used to support the thesis that the greater incentive value of competition is instinctive in origin. It may be due to the long conditioning effected by school practices which stress individual rivalry. The experimental results may also be influenced greatly by the likelihood that the forms of coöperation used were relatively unreal and meaningless to the subjects. There are some writers who believe that there is evidence for the statement that "human beings strive for goals, but striving with others (coöperation) or against others (competition) are learned forms of behavior."²

It might be well in passing to note the possible detrimental effects of rivalry on personality when individual pupils are paired for competition with other individuals of greater ability. If individual rivalry is utilized as a motivational device in education, it is probably defensible only when each member of the pair can win
provement," *Journal of Educational Psychology*, vol. 19 (October, 1928), pp. 480-484.

¹ J. B. Maller, *Coöperation and Competition, an Experimental Study in Motivation*. Columbia University Teachers College Contributions to Education, No. 384. Columbia University, 1929.

² M. A. May and L. W. Doob, *op. cit.*, p. 23.

about half the time. It is much better for development of constructive attitudes to use group motivation or urge individuals to compete with their own scores.

Knowledge of progress. The incentive value of improvement is well established. In one of the most decisive experiments on the problem,¹ two equivalent groups of 358 fourth grade pupils each were given identical arithmetic drill exercises fifteen minutes a week for twenty-one weeks. Teachers withheld from the members of one group the knowledge of their weekly score. Each pupil in the other group determined immediately his rating on the standards provided for each drill, and kept an individual progress chart to express his improvement—or lack of it—graphically. The achievement of the group which kept itself informed on its progress was significantly superior to that of the uninformed group.

One of the oft-quoted experiments in which college students were subjects is that by Book and Norvell.² They assigned 124 juniors and seniors the following tasks: writing the letter *a* as accurately and rapidly as possible, crossing out letters in Spanish words, substituting letters for the digits of five-place numbers according to a key, and multiplying two-place numbers. The subjects were divided into stimulus and control groups. The stimulus group determined their scores after each practice period, were urged to study the results for means of improvement, and were encouraged to do better work. The control group worked without these three factors. The conditions described obtained during two-thirds of the experiment. Both groups gained, but the stimulus group constantly gained in superiority. After thirty practice periods, the conditions were reversed. Those who had been the control group were now given the experimental incentives. During the last fifteen practice periods, the original control group gained markedly, while the scores of the original stimulus group declined.

¹ Isidoro Panlasigui, "The Effect of Awareness of Success or Failure," *National Society for the Study of Education*, Twenty-Ninth Yearbook, pp. 611-619. Public School Publishing Company, 1930.

² W. F. Book and L. Norvell, "The Will to Learn, an Experimental Study of Incentives in Learning," *Pedagogical Seminary*, vol. 29 (December, 1922), pp. 305-362.

Praise and reproof. One of several experiments on the relative effects of praise and reproof dealt with the ability of fourth and sixth grade children to respond to column addition of six three-digit numbers.¹ Four equivalent groups were used. Group A was the control group. In group B the children were called by name and praised in front of the class after each of five fifteen-minute tests. In group C the children were called by name and reproofed for poor work before the class. Group D merely heard what was said to group B and C. The greatest improvement was made by the praised group, decidedly less by the reproofed, still less by the ignored, and none at all in the control. It is important to note that although praise was the most effective incentive, either praise or reproof is better than nothing. Reproof lost its effectiveness with repetition. Inferior children were more sensitive to praise, and superior children more sensitive to reproof.

Comparable results have been secured from other experiments both with school children and college students. The data, however, do not support the assumption often made that praise is universally preferable to reproof. The relative effectiveness of the two incentives probably varies with circumstances and with individuals, and with the same individual from time to time and from situation to situation.

Reward and punishment. Thorndike² reports evidence to the effect that the announcement of "right" (reward) to a correct response strengthens it more than the announcement "wrong" (punishment) weakens an incorrect response. On the basis of his experiments, Thorndike believes that "we may increase our confidence in positive rather than negative learning and teaching." He has accumulated a vast array of data to show that satisfyingness, arising from reward, is extremely potent in strengthening responses with which it is immediately or closely associated.

Although the potency of rewards is generally recognized, there is evidence to show that learning can also be facilitated by punish-

¹ E. B. Hurlock, "An Evaluation of Certain Incentives Used in School Work," *Journal of Educational Psychology*, vol. 16 (March, 1925), pp. 145-159.

² E. L. Thorndike, *Human Learning*, pp. 45, 46. Century, 1931.

ment. There was one experiment, for instance, in which correct responses by one group, and incorrect responses by a second group, were "punished" by a mild electric shock. The results indicated that the group of subjects who were required to learn the punished reactions, and to avoid the non-punished ones, did so more rapidly than the subjects who were required to learn the non-punished responses and avoid the punishment-giving ones. In this case the punishment on correct reactions apparently was more "emphasizing" than punishment on the incorrect ones.¹

Neutral repetition—that is, responses which are not accompanied or followed by some consequence such as reward or punishment, satisfaction or annoyance, or knowledge of correctness or error—is of little value in human learning. The things that count are the things that matter, one way or another, in relation to wants and goals. In many instances, punishment seems to aid in learning because of its informative significance, but it may also have a facilitating effect apart from the giving of signals or guiding cues.² This facilitation, for example, provokes a change to a desirable response, or stimulates variable behavior from which successful reactions may emerge. When the task an individual is trying to learn is easy or moderately difficult for him, an increase in the intensity of punishment may result in increasing the speed of learning and reducing the number of errors. But if the task is difficult for the learner, punishment may cause disruption rather than facilitation.³

One should remember in interpreting experiments on the effect of reward and punishment that these are relative and not absolute factors. What is a reward under one condition may be a punishment under another. Likewise, the incentive factor may be interpreted differently by different persons.

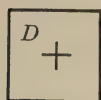
Positive and negative valences. The effect of reward and punishment on an individual when he is required to perform some act

¹ E. C. Tolman, *Purposive Behavior in Animals and Men*, pp. 344, 345. Century, 1932.

² R. W. Gilbert, "A Further Study of the Effect of Non-Informative Shock upon Learning," *Journal of Experimental Psychology*, vol. 20 (April, 1937), pp. 396-407.

³ P. T. Young, *Motivation of Behavior*, p. 287. Wiley, 1936.

other than the one he prefers has been described in terms of the relative valence which the incentives possess for the person.¹



If a child faces an intrinsically interesting task, there is a vector, or force in the direction of the task, which impels him toward it. This situation is expressed in Figure 2,² in which D represents an interesting task, and $+$ its positive valence. The vector or force V impels the child (C) in the direction of the task.



When the task is unpleasant, the vector acts as a thrust away from the task, as in Figure 3, in which T represents an unpleasant task and $-$ its negative valence. The force is in the direction away from the task.



Fig. 2

In such a case either a reward or punishment might be introduced to induce the child to perform the task. If the child is faced with punishment, he is then between opposing forces, as pictured in Figure 4. Both the task (T) and the punishment (P) have negative valences.

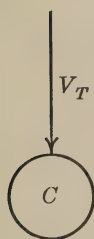
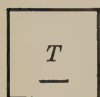


Fig. 3



Fig. 4

If the vector from the punishment situation is stronger than that from the task, and in the opposite direction, the child may be expected to complete the work or, perhaps, to try to escape from the field. Because the individual in the conflict situation just described may attempt to escape by flight, by deceit, by postponement, by showing defiance, by flight into fantasy, by emotional outburst, or by overt struggle with other persons, certain barriers must be erected to hold him within the field. This is suggested in Figure 5, in which B represents the barrier which incloses the field. The

¹ Kurt Lewin, *A Dynamic Theory of Personality*, pp. 114-170. McGraw-Hill, 1935.

² Figures 2 to 7 are taken from K. Lewin, *op. cit.*, pp. 118-127.

barrier may be physical or, in most instances, such factors as authority, personal pride, or expectation of social or personal pressures. There is still one possible way out, however. If the punishment set up as the alternative to performing the task is not

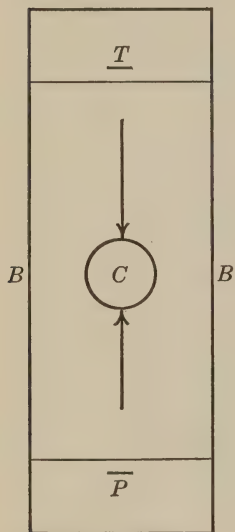


Fig. 5



Fig. 6

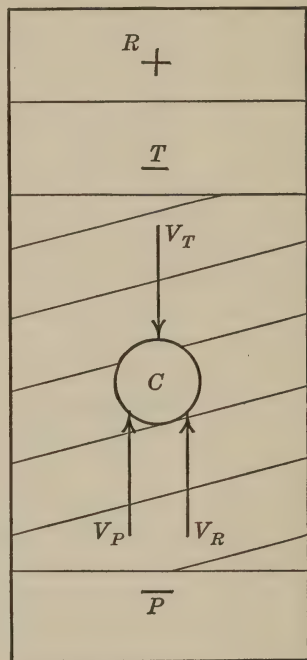


Fig. 7

sufficiently strong to dominate, the child may accept the punishment as a means of escape.

Instead of securing performance by threats of punishment, it is possible to evoke it by offering a reward which will exert a positive valence stronger than the negative thrust of the task. (See Figure 6. V_R indicates the force of a reward with a positive valence.) The essential point of control here is that the individual must not be allowed to secure the reward without actually completing the task.

Reward and punishment may combine forces in directing behavior. Thus the thrust of a punishment and the positive valence of

a reward may both be opposed in direction to the negative force of an unpleasant task (see Figure 7).

Fortunately an individual may find when he attacks a task that it is not as unpleasant as he expected, or it may turn out to be actually satisfying. Its valence then changes. The problem of securing favorable action is considerably eased if a task which might prove unpleasant or uninteresting is embedded in, made a definite part of, other situations which possess for the individual a positive attraction.

QUESTIONS

1. Explain why behavior always depends upon more than the external situation to which the individual reacts.
2. Is it possible always to infer an individual's motives directly from his observed behavior?
3. Are individuals always aware of their own motives?
4. Summarize the criticisms of the theory that man inherits a set of pattern-reactions called instincts.
5. Show how an organism's behavior is related to its structure.
6. Explain how a mother's care of her child may be due mainly to social pressure in the beginning, but finally becomes a matter of sheer enjoyment and devotion.
7. What is a possible explanation of the fact that interrupted tasks are sometimes remembered better than completed ones?
8. To what extent are organic drives rhythmical in their functioning?
9. What interests do you have which now carry their own drive but which were once mainly instrumental to attainment of other objectives?
10. Evaluate: (1) The instinct of pugnacity makes war inevitable. (2) Since man is by nature competitive and acquisitive, economic institutions must always be based on a doctrine of self-interest.
11. Distinguish between primary and secondary drives.
12. Show how both desirable and undesirable habits may be learned in the service of basic needs.
13. Give illustrations of the ways in which acquired purposes become the most effective forms of human motivation.
14. Suggest ways of stimulating individuals to develop new interests.

15. What interests have you acquired recently? How were they developed?
16. What practices in American schools help to create or strengthen competitive behavior? What procedures might stimulate more adequately the development of coöperative behavior?
17. Which pupils probably most often receive praise—the ones who need it most or least?
18. Why is neutral repetition less effective than learning activity which is accompanied or followed by some consequence?

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CHAPTER VII

OUR EMOTIONAL LIFE: ITS GENESIS AND CONTROL

COMMON SUPERSTITIONS ABOUT EMOTIONS

Love makes the world go round, so they say, and along with it the head of anyone who attempts to understand the true nature of emotion only through his own experience or by listening to common talk. That there is something which, under some conditions, strongly reënforces human behavior is a matter of common observation. That this something, called emotion, seems at times to act in ways which defy classification, prediction, and control is also commonplace. But the real nature of the something is a matter about which we have been sadly in doubt. At the present time there is considerable disagreement among authorities, but this should not lower the respect of the student for the excellent work of psychologists like Jersild, Lund, Ruckmick, Landis, Goodenough, Marston, and others.

Popular superstition abounds with false beliefs concerning the nature of emotion, its mechanism, and its distribution quantitatively in the population. There is, for example, the belief that redheads are quick-tempered. And who has not heard of the "fact" that brunettes are more emotional than blondes—or is it the other way around? Women have finer emotions than men—or do they? Nordics are phlegmatic and unemotional whereas Latins are volatile and highly emotional. Irishmen are always looking for a fight because they get angry so quickly; and since they are not afraid of fights, they make the best policemen. All of these and many more beliefs like them illustrate the interest in the topic and the misinformation concerning it, for when we come to examine the data upon which these beliefs are based, we find not an accumula-

tion of experimental evidence but a series of old wives' tales and personal experiences. But people are willing to act on these beliefs. The personnel director of a large industrial concern subscribes to the belief that brunettes are more emotional than blondes. Consequently, a brunette applying for a position in the firm is, other things being equal, at a disadvantage. Why? In the opinion of this personnel director whose job it is to act as a human sieve, a clerk in a store is an unemotional selling machine. If brunettes are more highly emotional, they are more likely to get angry quickly and quarrel with customers; they are more likely to fall in love with the floorwalker; they are more likely to be talking over their sex life while customers fret and fume. Another personnel director believes that blondes are fickle, frivolous, and foolish. He considers their reputation for instability well deserved, and instability is no qualification for sales persons. Therefore, in his hiring, he selects brunettes. It all ought to work pretty well, particularly if the girls apply at the right place. And what about the two personnel directors? Oh, they have a fine time bickering about the thing at luncheon, and even getting a little emotional themselves.

DEFINITIVE ALTERNATIVES

We have opened our discussion of emotion in a rather light vein. Let us now become more serious and try to reduce this admittedly elusive subject to objective, tangible terms. Before undertaking a formal definition of emotion, we shall examine three ways of looking at emotion. It is possible to speak in the language of any one of the three and make sense within the limitations of its assumptions.

(1) *The physiological alternative.* Emotions, whether they be the result of bodily action or the cause of it, are accompanied or caused by definite physiological products. For the most part, these products proceed from the ductless glands and are called hormones. Emotion defined in this physiological and chemical way has a deceptive scientific appearance. It might even be possible to tell a love story in terms of hormones, but nobody would read it, or understand it if he did read it.

(2) *The behavioristic alternative.* Emotion may be regarded entirely as a series of behavior or conduct phenomena. Looking at it this way, we may not care at all about internal determinants of the behavior. Since behavior is all that can be observed (nobody ever saw with the naked eye a hormone at work), the behavioristic point of view is a practical one. Furthermore, it permits the various forms of emotional behavior to be classified with at least a semblance of regularity and system.

(3) *The purposive alternative.* Emotional behavior is seldom a wild, diffuse reaction. It is usually directed toward some definite goal. So strongly has the purposive nature of emotion impressed some writers that they are willing to talk about such things as an "instinct of pugnacity" accompanied by an emotion of anger and directed toward a fight with somebody. Although the purposive theory of emotion and emotional behavior by its intangibilities is somewhat unsatisfactory, it must be admitted that the case is not entirely without support. Emotionalized behavior is more or less systematized to serve a utilitarian purpose, and it proceeds according to fairly predictable methods. For example, one frequent purpose of emotionalized behavior is to overcome obstacles. It may be contended with some show of plausibility that the obstacle itself provokes the emotion, but the fact remains that the resulting reënforced behavior does not usually take the form of a diffuse emotional seizure, but is aimed directly at the thwarting object itself with a reasonably controlled attempt at its removal.

CHARACTERISTICS OF EMOTION

In psychology human conduct and animal behavior are discussed as though this conduct and this behavior could be divided into segments and examined as some dissected organ of the body. We talk freely about reaction units such as the neuron, about driving forces such as instinct, about glandular reënforcement of action, and about a multitude of other things as though all were compartmentalized and separate. We deal with stimuli and responses. Sometimes we even try to diagram the stimulus-response situation. This, too, appears like an atomistic and more or less static unit of behavior.

All this is useful in systematizing our thinking and speaking about the laws of conduct. But one thing must be constantly kept in mind: *Human conduct from birth to death is a ceaseless, continuous, dynamic process involving the maintenance of balance in internal economy and an adjustment to the outer environment, physical and social.* Therefore, when we speak of the characteristics of any phase of this dynamic process, we are merely describing one wave, so to speak, on the ever surging sea of life; it is no more possible to separate the wave from the larger complex in the one situation than in the other.

With this in mind, we may undertake a description of the characteristics of emotion. Professor Sandiford has stated these so well that we shall borrow his classification¹ of the characteristics and interpolate some comments upon each. He lists the following characteristics of an emotion:

1. Typical bodily expression
2. Tendency to appear at all ages
3. Wide range and low threshold
4. Persistency
5. Tendency to interfere with judgment
6. Susceptibility to conditioning

(1) *A characteristic bodily expression.* The body is a chemical compound of puzzling but potent possibilities, and an energy converter of rare effectiveness. In the expression of emotion profound changes, both chemical and energetic, occur. Glandular products pour into the blood. Total bodily tonus is heightened. The heartbeat and breathing rate accelerate. In addition to these general characteristics or attributes of emotional action, there is also a typical expression of individual emotions. These can be distinguished with a fair degree of reliability by different observers. But we shall see presently, in discussing the number of emotions, that even a reliable nomenclature does not necessarily imply a distinctive postural state for each of the several emotions named, although stereotyped

¹ Peter Sandiford, *Educational Psychology*, pp. 134-137. Longmans, Green, 1930.

learned facial expressions are partial clues. Partly because of native factors, and considerably through the learning of standardized modes of expression, the demonstration of human emotion has a tendency to take certain recognizable forms.

(2) *Appearance at all ages.* Man exhibits emotional behavior at all ages. Infantile and senile emotions tend to resemble each other in that they are relatively few. In the interim between infancy and old age, a comparatively small number of native emotional responses in the baby become conditioned in a multiplicity of ways, and the same responses come to be given to a wide variety of stimulations. Conditioning waxes especially during adolescence, remains fairly constant during adulthood, and tends to wane with old age along with the loss of other associations and the natural limitations in conduct.

(3) *Wide range and easy arousal.* Little will be said at this point on the subject of the wide range of emotions mentioned by Sandiford. Definite cognizance of this characteristic will be taken in the discussion of the conditioned emotions and emotional association. For some reason not entirely understood by physiologists, thresholds for emotional responses are low; they are easily aroused. For this reason, the inhibition of emotional response is fairly difficult and presents a perplexing problem to parents and teachers whose task it is to condition the young to certain social taboos which forbid the natural expression of emotion.

(4) *Persistency.* Perhaps because of the widespread involvement of many reactors, emotional conduct tends to persist, sometimes long after the provocative situation has been removed. It is probably possible to explain this emotional perseverance in matter-of-fact physiological terms. Emotion involves definite and rather profound chemical changes, and these at times subside slowly. A person who flies into a fit of rage during or soon after eating his dinner is likely to find his digestion impaired for some time afterward. Like the alcohol in the drunkard's blood, the hormonal bases of emotion are not eradicated in a second. Instead, a considerable period must elapse before chemical balance is restored.

(5) *Interference with judgment.* Few persons have not had the experience of doubting, upon sober reflection, the wisdom of such emotional reaction as a fit of anger. Emotion and judgment are almost antithetical. Judgment is not to be confused with the sustained emotional drive which is sometimes directed toward vague but greatly desired goals.

(6) *Easily conditioned.* A later section in this chapter discusses the conditioning of emotions. In preparation for this discussion, we may note here, first, that emotions are easily and widely conditioned; and second, that once conditioned, they are reconditioned with considerable difficulty.

NUMBER OF EMOTIONS

Popular parlance contains hundreds of words (such as *love*, *hate*, *fear*, *rage*, etc.) to describe emotion. Other hundreds describe the attributes and effects of emotion (such as *elevating*, *debasing*, *glorifying*, etc.). For the most part, these terms are meaningful, but in a certain sense they are misleading, also. It would undoubtedly be erroneous to assume that the number of emotions even approximates the number of words that the language contains to describe emotional states. There is a vast difference between a symptomological classification of emotions as given by a more or less unanalytical observer and the number of emotions as measured by basic differentiation in physiological or physical causation.

Many adults have numerous fears. How do we account for them? There are two things to be noted. First, emotions may be conditioned. Since they are easily modified, as we have observed in listing their characteristics, theoretically there is scarcely any limit to the number of conditioned emotional reactions that the adult may have. Second, a strongly conditioned response, to all intents and purposes, has the same practical social conduct value as an "original" response.

But the problem still remains of the number of "original" emotions. Many psychological theorists have dealt with the problem. Two theories in particular seem most nearly to fit the facts; and although superficially they may appear to stand at variance, actu-

ally they are not far from supplementing each other. Watson ¹ has allowed for a small number of differing original emotions which are fairly specific and given in response to definite categories of stimuli. The number soon becomes expanded by the process of conditioning; as a result, we see in the adult a combination of native and acquired emotional reactions. Like Watson, Marston regards as somewhat fallacious the elaborate descriptive categories of emotion found in popular speech. According to his view, certain classes of stimuli tend to produce ascendant or exhilarating emotions and certain other classes depressing emotions. The response which is given is more or less appropriate to the situation calling it forth, and the non-technical descriptions which will result are in terms of the evoking stimuli rather than in terms of the physiological mechanism of the emotion. Occasionally, when the physiological potential is low, a stimulus which would normally evoke an ascendant emotion calls forth the opposite. It may readily be discerned that, according to this physiological theory, the number of basic emotions is small.

CONDITIONING OF EMOTIONS

Pavlov ² demonstrated the facility with which glandular reaction may be conditioned. Pavlov was working with a duct gland; the ductless gland may also be conditioned. While the basic mechanism is not clearly understood, the fact that emotional responses come to be given to new categories of stimuli is clearly established.

Emotions being susceptible of conditioning, it is apparent that habit plays a part in emotional life. Observation of everyday affairs strengthens rather than weakens this view. Since conditioned emotional responses tend to persist, at least for a time, and since they tend to become fixed with practice, the value of the correct formation of emotional habits is obvious.

Let us examine certain conditioned fears, to illustrate some of the

¹ John B. Watson, *Psychology from the Standpoint of a Behaviorist*, Lippincott, 1919; J. B. and R. R. Watson, "Studies in Infant Psychology," *Scientific Monthly*, vol. 13 (December, 1921), pp. 493-515; and Carl Murchison (Editor), *Psychologies of 1925*, chapters by John Watson, Clark University Press.

² I. P. Pavlov, *Conditioned Reflexes*. Oxford University Press, 1927.

points which we have been discussing. The young child is afraid of comparatively few things. He is not, for example, afraid of the dark. But unhappily his fears soon increase in number. Perhaps he learns to fear the dark while imprisoned in a dark closet as a punishment. As the conditioned fears grow in number, everyday conduct becomes more and more influenced and the individual's conflict with his fears becomes more distressing. It is true that, following the regular laws of conditioning, conditioned fears or conditioned emotions of any kind may tend to die out. Their persistence is such, however, as to constitute a factor in practical conduct.

It is possible to develop conditioned emotional states and be relatively unaware of the occurrence. Subliminal stimuli in the environment in which a fear or other emotional conditioning has taken place tend later to call out the same response. This is probably the explanation of some of our vague likes and dislikes of people and of places. For example, I may tend to avoid restaurants which resemble the one where I was served a caterpillar in my dish of stewed tomatoes. The avoidance reaction set up to the caterpillar transfers to associated objects in the environment. Later, a similar environment calls forth the total response.

Since fears and other emotional responses are so easily conditioned, the early years of training take on an added significance. In these years, because of the association and conditioning process, the emotional matrix which will influence one's later life is developed. Since children learn some social taboos very quickly and, among these, certain negative taboos toward expression of emotional states such as anger, and since this concealment of emotional reaction complicates the observer's problem, it is doubly important that parents or anyone else who deals with children be especially careful to note minimal indications of emotional states. After the child has learned to forego naïve and eager statements of likes and dislikes, it is less easy to discern the beginning of emotional disorders. Careless observation at this time may radically influence the individual's psychological development for the worse.

INFLUENCE OF EMOTIONS ON GENERAL BEHAVIOR

Because of their widespread bodily nature, emotional states influence general behavior. This is done in several ways. In the first place, considerable reënforcement occurs. As we have said in discussing emotion in a preliminary way, the human organism is an effective energy converter. It is obvious, however, that at different times it employs amounts of energy which vary greatly. In those kinds of situations which we call emotional, the energy-converting process is definitely increased. This is known as reënforcement. Ordinary observation of gross bodily behavior is enough to furnish the evidence on this point. However, more refined measurements have been devised which determine the amount of energy consumed in certain kinds of work. It has never been possible, however, and perhaps never will be, to contrive a machine to measure the total energy consumption of the entire organism during a particular performance. This fact, however, should not be too strongly urged against the validity of the contention that emotionalized action is conflict. Some psychologists even go so far as to say that, unless there is interference with the normal progress of action, no emotion results. Whether or not this extreme position can be substantiated, there is no question that much emotionalized action is the result of thwarting. Elaborate psychological devices are not necessary to demonstrate this proposition. Analysis of one's own experience is sufficient. The reaction of the hungry dog from which we try to take a bone is proverbial and generally accepted. Casual observation of analogous human situations gives plenty of similar evidence. Wise social tacticians carefully avoid interposing interferences in the path of those whose good will they desire when such persons are in the pursuit of a highly desired objective. The emotionalized behavior resulting from thwarting and conflict is often a sad waste of energy. Biology has not yet caught up with civilization, and the angry man today may have murder in his heart as did the cave man. Interference with his peaceful pursuit of murder still further heightens the emotionalization which originally probably started with some other interference. In many situations there is no way to avoid this.

Sometimes, however, it is possible to bring about a process which attenuates the conflict. This process we shall now discuss.

When our conduct meets with interference, direct emotionalized behavior is likely to result; but sometimes it is possible to guide the individual into a substitute line of behavior. This is called sublimation. Sometimes the sublimated behavior itself may be comparatively non-utilitarian. The angry man, unable to annihilate the object of his wrath, but too angry to turn his attention to any constructive activity, dissipates the generated energy in inordinately violent, unproductive pursuits such as throwing books, slamming doors, or muttering to himself. Many a dog, innocent as a newborn lamb, has served as the hapless butt of a substitute emotional response.

It is possible for sublimated conduct to be relatively cohesive and to serve a useful purpose. This is particularly likely to be the case when the individual has been given some training by his elders and fellows in the control of emotions. A group of individuals forced to live together, in a fraternity house, for example, must of necessity learn to substitute other responses for overt emotional ones. The "spoiled" individual frequently has a serious struggle under these circumstances. Although substitution is not easy, it can be learned and, once learned, it becomes habituated and constitutes a valuable adjunct to human adjustment. In such a case, for example, the irate fraternity man learns to vent in the vicious swatting of a ping-pong ball the surplus energy which his roommate's provocative action has aroused.

Sublimation or substitution of emotional responses constitutes a definitely social reaction. For this reason the wise parent is extremely loath to let his child develop without social relationships with other children. It is most difficult for such a child to make the adjustment later.

GLANDULAR DETERMINANTS

We have reiterated in this chapter that emotion is not a vague subjective state residual in or emanating from some metaphysical entity known as the mind. Emotionalized conduct rests upon

definitely physiological bases. Gardner Murphy illustrates this fact in connection with fear responses. He says: "Change in pulse thus showed a definite fear pattern. These physiological changes follow a definite course which is similar from one subject to another; there are also fairly consistent changes in blood pressure. Fear is therefore not to be regarded as merely a subjective state. There seems to be a fairly uniform and definite physiological pattern."¹

"A fairly uniform and definite physiological pattern," says Murphy and he implies the same for other emotions as well. But what is this physiological basis of emotion to which we referred? It has many phases. The one which has attracted the most attention in recent years is the glandular phase. We have already discussed, in Chapter III on *Foundations of Behavior*, the glandular determinants of conduct. One other question remains which may be disposed of briefly.

How distinctive are emotional states, viewed physiologically? We have already made reference to theories which imply that the physiological basis of emotion is rather general and may possibly be similar for several emotions. In young children, the line of demarcation between kinds of emotional response is vague. Watson's original work showed fairly well defined fear responses given in response to stimuli such as a loud noise. He also established a fairly plausible differentiation between fear and rage. However, it is with maturity and experience that definitely differentiated emotionalized conduct patterns appear. Some of these may be true results of maturity; sex reactions have been mentioned in Chapter III as belonging in this category. Others, like the stoicism of certain historical groups, are unquestionably the results of learning.

NEURAL DETERMINANTS OF EMOTION

So far, we have discussed emotion from the standpoint of the stimuli or the provoking situations, in terms of certain of the chemical elements such as the hormones, and in terms of gross behavior. There still remains the not inconsiderable question of the connection between the stimuli and emotional response. So far as the process of conditioned emotional responses goes, the nervous system seems

¹ Gardner Murphy, *A Briefer General Psychology*, p. 86. Harper, 1935.

to serve its usual purpose. Although, as we have frankly noted, the processes of neural transmission, synaptic resistance, and nerve conduction are not too well understood functionally, the general process is clear enough to stand on a hypothetical basis. There is another question, however, which remains: Is there a brain center for emotion?

In both the theorizing and the experimentation on the brain is to be found some of the most interesting, fascinating, and exacting work of all the fields of psychology. It may be stated that there is considerable evidence that specific parts of the brain are definitely involved in emotional reaction. In particular, the thalamus appears to play a vital rôle in the nervous processes connected with emotional reactions. Two divergent lines of evidence—pathological studies and experimentation on animals—point to this fairly centralized control. Naturally, conclusions based on *de vivo* observation of pathological conditions, even when followed by post mortems, must be interpreted conservatively. Animal experimentation, on the other hand, while subject to certain types of control, is always open to the criticism that inferences from it concerning human functions must be made with caution. The decerebrate animal, for example, presents a most interesting series of phenomena, but it is a far cry from these data to sound conclusions on the neurological factors involved in the control of human emotions.

Even when viewed in the light of scientific caution, evidence pointing to some kind of localization of emotional control in the brain stem is reasonably conclusive. Furthermore, the area involved is comparatively small. Extirpation experiments on animals point definitely in this direction.¹

The function of the cerebral cortex, that vast mysterious storehouse of human experience, is, in the case of emotional control, somewhat a matter of conjecture. The cortex seems to serve as a checking agency. Loosely speaking, it may be regarded as "played off" against the thalamus and the brain-stem centers. At least, when portions of the forebrain are removed, rage responses in

¹ W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage* (Second Edition). Appleton, 1929.

experimental animals seem at times to be increased; and although this negative line of evidence is open to some criticism when it is used as a basis for the reversed inference that the presence of the cortex serves as a check, still, in the absence of any other demonstrable relationship, this conclusion may be tentatively accepted.

FEELING

It is no easy task to prepare an even reasonably scientific discussion of the problem of feelings. In a sense, feelings might be regarded as incipient or partial emotions, although the evidence for this is sketchy indeed. In any case, they appear to be related to emotions. Both seem to have the same brain center control. Gardner Murphy, whose excellent discussion of this point may be read with profit, says:

Experimenters have studied the relation of these feelings to the centers in the brain stem which we have already described as the seat of the emotions, and have shown that the same center in the brain stem which underlies the expression of the emotions underlies also the experiences of pleasantness and unpleasantness. Persons suffering from disease in this part of the brain stem . . . are upset by very slight stimuli—the scratching of the skin with a needle which would ordinarily produce slight unpleasantness produces excruciating pain; the hot water bottle which would ordinarily produce mild pleasantness produces very intense pleasure. The exaggeration of these feelings was a uniform finding among such patients. Particularly striking is the fact that when the brain stem was injured on one side and not on the other side, stimulation of the brain stem produced exaggerated pleasantness or unpleasantness in one side but not in the other. It appears, therefore, that the center for the emotions is also the center for the feelings, and this justifies us in the conclusion that this experience which we call feeling is psychologically very close indeed to the experience of what we call emotion. It would probably be correct to say that simple feelings, such as those aroused by a cool breeze or a refreshing drink, and definite emotions, like fear and rage, are all controlled partly or completely by this brain-stem center.¹

One thing which makes the study of feeling and feeling tone extremely difficult is the fact that they do not give rise to, and are

¹ Gardner Murphy, *op. cit.*, p. 98.

not accompanied by, the same gross morphological displacement which an attack of rage, for example, will involve. Consequently, the study of feeling depends upon that highly dubious psychological technique known as introspection or the analysis of one's own internal behavior. But the reasonably demonstrable similarity in central control of emotion and feeling, and the fact that feeling states may, under certain kinds of cumulative stimulation, verge imperceptibly into emotional states, incline one to the perhaps natural conclusion that the two are phases of the same process. At least there is a strong temptation to associate the uplifting emotions and pleasant feeling tone, and the depressing emotions and unpleasant feeling tone.

Thorndike, in an early discussion of the fixation of learned responses, stated that those feeling tones which are satisfying tend to facilitate learning, and those which are unsatisfying tend to interfere with it. It is interesting to note that the demonstrable interference with judgment which Sandiford¹ mentions as a characteristic of emotion, fits in closely with Thorndike's theory that the unsatisfying feeling interferes with learning, particularly learning which involves nice judgment.

The school of experience has something to say on feeling. It speaks, for example, through sales managers. Sales managers have the habit of taking out-of-town buyers to dinner and doing everything possible to develop in them a pleasant feeling tone. Perhaps this amiable custom has no economic significance—and, more likely still, perhaps it throws no light upon the relation between emotion and judgment, not to mention the relation of each to feeling. But the practice seems to be fairly well established, and there are those who maintain that the buyers' best judgment, even when no blackmail is involved, is sometimes apparently not used when placing orders in a condition of pleasant feeling tone.

EMOTIONAL CONTROL

Many principles of emotional control could be given. All such principles are to be considered seriously, for such control is a requi-

¹ Peter Sandiford, *op. cit.*, p. 136.

site of successful citizenship and membership in modern society. It is impossible to pick up a daily newspaper without being confronted with numerous accounts of crimes which are the result of emotional outbursts.

In discussing emotional control, we are dealing not with a technical discussion of the internal controls of emotional action, not with the chemical alterations which take place during the reaction, not with the neural concomitants or causes, but with social behavior. Therefore, any factors which are active should be studied. We shall consider three: (1) habit, (2) high threshold, and (3) delay.

(1) *Habit*. Habitual control need not be discussed at length. It has been treated in our general discussion on emotion. The important thing to bear in mind is that much of our emotional life, at least on the demonstrative side, is made up of learned reactions or responses. As such, it follows the definitely established laws of learning. It is fantastic to expect to practice oneself in a given kind of emotional response and then, in a situation demanding another kind, give anything other than either an awkward imitation of what we know is demanded or a performance which we have practiced.

(2) *High threshold*. A high threshold of response means that response is slow. A low threshold means that response occurs easily. Therefore, in putting forward high response thresholds as a factor in emotional control, it is implied that there are some situations normally provocative of emotions to which social training conditions a raised threshold.

If you put a rubber band around your head, you are aware of it at first. After a time you cease to notice it, as you do not notice your clothes; you have become negatively adapted to them also. If another rubber band with greater tension and perhaps of greater width is used, it will again be noticed, but after a time it likewise will be disregarded. In this way the threshold of response to that particular kind of stimulation will be raised.

We do the same sort of thing in learning to control our emotions. If one is trying to learn to control his temper but gives anger responses to relatively slight situations, he is progressively lowering

rather than raising the threshold; thereafter, when a social situation demands self-control, a distinct effort will be necessary, and the effort will frequently be futile because all of the previous practice has emphasized expression. On the other hand, tolerance of relatively mild stimuli will raise the threshold progressively.

(3) *Delay*. A well-known statesman once seriously proposed that nations on the verge of conflict agree to arbitrate for one year and then go to war. His theory—and it is not a bad one psychologically—was that if every nation in the world would seriously abide by this agreement, war would end. Emotional perseverance, although it is definitely present in both individual and group reaction, does not usually extend over a long period. The device of counting to ten before letting fly with one's fists is based on the same principle.

The examples in the preceding paragraph contain an obvious inference: if emotionalized action can be delayed, even by artificial devices, it is likely that it will never take place.

QUESTIONS

1. What are the definitive alternatives? Which seems most practical to you?
2. Give Sandiford's list of characteristics of emotions. Explain these in your own words.
3. Refer to Chapter III for Watson's work on original emotions.
4. Support, with examples from your own observation, the contention that many fears are not original emotions.
5. Under what circumstances is it not advantageous to have behavior affected by emotional drives?
6. Make a list of rules for emotional control which you could use in adjusting to your own problems.

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CHAPTER VIII

INTELLIGENCE AND SPECIAL APTITUDES

NATURE OF INTELLIGENCE

Adaptive behavior. Intelligence testing is still the subject of ill-conceived and exaggerated claims, and of acrid and intolerant opposition. In the meantime the student whose "intelligence" has been assessed—probably several times—by the testers may well wish to know what intelligence tests do, and how useful their results are in human engineering. What is intelligence? Is it a general capacity which can be expressed by a single number? Or are there several kinds of intelligence? If so, can an individual possess varying amounts of the different capacities? How long does capacity as such increase in amount? Is intelligence inherited, and is its growth relatively independent of education and other environmental influences? Which kinds of tests are available for the measurement of capacity? How much confidence can be placed in the results? What is the relation of intelligence test results to success in school and in occupation? If an individual ranks much below the general average in ability to acquire facility in one set of tasks, has nature endowed him with a compensating superiority in another field? Are there different degrees of effectiveness, amenable to training, with which one might use a given amount of capacity?

Recent progress in mental testing has indicated that one must not consider intelligence as an entity, or faculty, or vital power, which exists apart from man's responses to his world. An individual is intelligent to the extent that he adapts means to ends—to the extent to which his observation, his thinking, his remembering, and his other behavior are directed toward, and effective in, reaching a goal. Strictly, one does not describe intelligence, but intelligent behavior. If the ape without direct tuition can pile boxes one

on top of the other to reach a banana hanging from the ceiling, he has exhibited intelligent behavior. The child who learns to respond "Three" to the question "How many are there?" no matter what three objects are presented, gives evidence of intelligent adaptation in acquiring number concepts. The student who successfully completes a number series, as: 6, 8, 7, 9, 8, 10, —, —, or a verbal analogy, as: *head : hat :: (sew, cloth, finger, hand) : thimble*, has made intelligent responses with respect to that task or objective.

Measurement of complex functions. In their earliest attempts to determine the relative intelligence of individuals, psychologists employed measurements of very simple psychological functions, such as reaction time, least noticeable difference in weight, and two-point threshold on the back of the hand. These responses, however, proved inadequate in revealing differences in the capacity of children to master school tasks. As early as 1895, Binet, as a means of differentiating more reliably the subnormal from the normal children in French primary schools, decided to rank subjects on their responses to much more complex situations, involving such activities as remembering, reasoning, comparison, use of number concepts, and recognition of common objects. Binet initiated the movement to infer intelligence from the operation of the so-called "higher mental capacities."

Definitions. Psychologists have spent more time in devising mental tests than in defining the concept of intelligence. Their purposes have been to distinguish among individuals with respect to certain tasks, or to rank them according to some external criterion, such as success in learning school subjects. Nevertheless, many definitions of intelligence have been proposed.

Binet emphasized three phases of intelligent behavior: (1) the ability to take and maintain a definite direction, (2) the ability to make adaptations for the attainment of a goal, and (3) the power of auto-criticism. Terman considers a person intelligent "in proportion to his ability to carry on abstract thinking." Stern conceived of intelligence as "a general capacity of an individual consciously to adjust his thinking to new requirements." Colvin wrote: "An individual possesses intelligence in so far as he has

learned, or can learn, to adjust himself to his environment." Thorndike defined intellect in general as "the power of good responses from the view of truth or fact." Pintner cautioned us to remember that intelligence is merely an evaluation of the efficiency of a reaction or group of reactions under specific circumstances. Pierón stressed the functional nature of the concept when he said that "intelligence does not exist in the mental mechanism; it is only an effect, a functional resultant under certain defined conditions, a behavior value." Woodworth emphasized the adaptive nature of intelligence in this definition: "Intelligent behavior is behavior conforming to the situation and to the goal." Again: "It [intelligence] is useful—it helps the individual to reach a goal." Intelligence has also been defined as deliberate variability or versatility of response. Many psychologists have defined it simply as the ability to learn. This is the concept that has dominated most of the tests devised to predict success in school situations. Intelligent behavior has the following characteristics:

1. *Difficulty.* This is a function of the rareness of successful accomplishment when a sufficient sampling of people makes the attempt. Thus as we go up through the Binet scale ¹ we find the tasks becoming harder.

2. *Complexity.* This is a matter of area. The person who can perform two or three difficult mental tasks, each at a given level of difficulty, is more intelligent than the one who can perform only one.

3. *Abstractness.* Mental activity deals with symbols and fragments. It is necessary to exclude difficult and complex acts which may be primarily physical and motor.

4. *Economy.* Other things being equal, the one accomplishing the most mental tasks in the least time is the most intelligent. Psychologically this appears to depend not on intuition, nor on skipping steps in the mental process, but on a faster rejection of false leads. Comparisons are made at incipient stages. The stupid person must spread the fabric out before him and run over every inch of it in detail in order to come to a decision—only to have his judgment surpassed by what appeared to be (but was not) the "snap" judgment of a superior person.

5. *Adaptiveness to a goal.* This is in opposition to aimlessness and futility. Thus mental activity alone is not an indication of mental power.

¹ See the discussion on pp. 174-176.

This has been so generally recognized by educational psychologists that some of them define intelligence as just this ability to make good adaptations.

6. *Social value.* This appears to be a necessary attribute in order to exclude the mental fumbings of neurotics and psychotics. They may carry on difficult, complex, abstract, speedy mental activities which are even adapted to a goal; but we say the goal is socially illegitimate and refuse to sanction the whole process. Of course, we err occasionally when a "crank" or visionary shows us to have misjudged him, but we correct the error by transferring him to the intelligent class.

7. *The emergence of originals.* This is to be likened to a chemical change. The scarcity of this phenomenon places a high value on it. It is the intellectual flower. But what little evidence we have seems to indicate that it usually springs from a fortunate combination of the six attributes previously listed.¹

General intelligence posited. Most of these definitions imply the existence of a general capacity, or of general intelligence. In accordance with this assumption, psychologists have attempted to express an individual's capacity by a single figure or a single word. This purpose necessitates the sampling of many mental processes operating in a variety of problems or situations. Practically, this sampling has ordinarily been confined predominantly to linguistic abilities and tasks. This fact led to the practice of calling these tests verbal or linguistic tests of "general intelligence," or, later, tests of "general" scholastic aptitude since they were composed of tasks comparable to those which comprise the bulk of school work.

Two-factor theory. Spearman, an English psychologist, believes that a general intellectual factor, in coöperation with many specific determiners, influences to a greater or lesser degree all mental abilities.² Investigators have revealed that there is a positive relationship among the different intellectual performances of an individual. This grouping of performances around the mean of the individual's abilities is due, according to Spearman, to the presence and operation of *g*, or the general factor. Each type of performance,

¹ G. D. Stoddard and B. L. Wellman, *Child Psychology*, pp. 176, 177. Macmillan, 1934.

² C. E. Spearman, *The Abilities of Man*. Macmillan, 1927.

however, is also conditioned by the presence of a specific, *s*, factor. There are many *s*'s but only one *g* for one individual. Although the *g* factor functions in every ability, it may not operate with equal influence. Spearman reports that his studies showed that in the talent for classics, the *g* factor was as much as fifteen times as influential as the *s*. In case of musical aptitude, however, the ratio was only one to four. This variable relation of *g* and *s* factors in the same individual may account for the fact that although there is a positive relation among a person's abilities, he may not be equally proficient in all of them, but more apt in some than in others. The *g* factor varies from individual to individual but is constant for any one person. The *s* factor, however, not only varies from person to person, but also for any one individual from ability to ability. To *g* and *s* has been added a group factor; that is, one common to a series of activities, but not all. It is important for one to inventory his aptitudes as completely as possible in order to discover those areas in which he may achieve most successfully.

Measurement of specific abilities. The presence of these special factors, and the unevenness of such characteristics as verbal abilities, number abilities, ability to deal with spatial relations, musical aptitude, and so on, in the same individual, has encouraged some psychologists to abandon the effort to measure general intelligence. They propose, instead, to define what they are measuring in terms of the specific tasks or specific types of responses involved in the test. Thorndike has been one of the leaders in this movement.¹ He describes intelligence in terms of ability to respond to specific situations. To discover the intelligence of a person, then, is to make an inventory of the tasks he can perform. The more "connections" or associations between situations and responses an individual possesses, the more "intelligent" he is. If the presence of a general factor is implied, it appears to be the capacity to acquire these connections. One needs, according to Thorndike, to know the difficulty of the tasks an individual can perform (*level*); the number of tasks at any level of difficulty which can be successfully handled

¹ E. L. Thorndike, *The Measurement of Intelligence*. Columbia University Press, 1927.

(*range*); the total number of situations at all levels to which one can respond (*area*) and the speed with which these responses can be made.

"*Types*" of intelligence. Thorndike has also suggested that it is possible for practical purposes to classify intelligent behavior roughly into three different kinds: abstract, concrete, and social. Abstract intelligence is defined as "the ability to understand and manage ideas and symbols, such as words, numbers, chemical or physical formulae, legal decisions, scientific principles and the like." These are the kinds of tasks ordinarily included in what have been called tests of "general intelligence." Mechanical intelligence involves "the ability to learn, understand, and manage things and mechanisms, such as a knife, a gun, a rowing machine, automobile, boat, lathe." Social intelligence involves "the ability to understand and manage men and women, boys and girls, to act wisely in human relations."

This does not mean that mechanical and abstract abilities may not both occur in high degree in the same individual. It does indicate, and the evidence bears out the hypothesis, that within any one of these groups of abilities, the relationship is likely to be higher than it is from one classification to another. This is one of the reasons why tests of abstract thinking have been relatively successful in predicting school achievement, but have been much less useful in business and industry, especially when employed to predict accomplishment in occupations requiring manual skill.

Intellect CAVD. That Thorndike himself considers his threefold classification one of general convenience only is shown by his practice of breaking these abilities down into much narrower reactions for testing purposes. He defines the test by the types of situations included. In spite of the fact that it correlates highly with other so-called tests of general scholastic ability, he prefers to describe one of his recent tests as measuring "Intellect *CAVD*." *C* refers to the ability to complete statements by supplying sensible words, *A* to solution of arithmetic problems, *V* to vocabulary knowledge, and *D* to understanding of connected discourse as indicated by following directions and comprehending paragraphs. Intellect *CAVD* is a combination of these abilities. In the same manner, tests might be

made to reveal intellect in manual operations, in artistic responses, and so on through all sorts of tasks which might be differentiated from one another.

Primary abilities. Thurstone has recently announced the discovery of seven primary, distinct mental abilities.¹ He considers it probable that research may reveal others, but that the final list will not be so numerous as is sometimes supposed. He used the method of factorial analysis in identifying these abilities. This process is a very complex mathematical one which Thurstone has summarized for the layman as follows:

The multiple factor analysis of mental endowment starts with the assumption that if several tasks require the same primary abilities for an effective performance, then the abilities of an individual will not be differentiated by these tasks. On the other hand, if several tasks require different fundamental abilities, it should be possible to differentiate people's abilities by performance on different tasks. The fact that people use different fundamental abilities for the same objective performance is considered explicitly in the analysis.

As a first approximation, it is assumed in factorial analysis that a person's objective performance in a test can be regarded as a sum of the contributions of his several abilities. Some of these abilities may be rather heavily weighted in a particular test, while others may have only slight weight or be entirely absent. For example, a performance in arithmetical work may be regarded as the sum of the contributions of several fundamental abilities. These might be number facility, ability to reason, mental speed, and so on. These abilities will enter into the arithmetical problems with different weights because some of the abilities might be more essential than others. Still other factors, such as ability to rhyme or word fluency or memory, might be entirely absent in the arithmetical task. The factorial constitution of different tasks would be expected to vary from one task to another.

Thurstone has found that the seven primary factors are uncorrelated (that is, that they vary independently of one another). He

¹ L. L. Thurstone, "A New Conception of Intelligence," *Educational Record*, vol. 17 (July, 1936), pp. 441-450.

Idem, "A New Concept of Intelligence and a New Method of Measuring Primary Abilities," *Educational Record*, vol. 17 (October, 1936), pp. 124-138.

does not consider that a general factor is necessary to account for the positive relationships which have been found among certain abilities of an individual; he points out that such a relationship might well arise from the presence of common factors in a succession of tasks. Thus one task might involve factors 1, 3, 4, 5; and a second task, factors 4, 6, 8, 9, 10. The positive relationship between the two could be accounted for by the presence of number 4 in both.

Thurstone secured data from the records of 240 college students who devoted fifteen hours of work in taking fifty-six psychological tests which included a wide variety of verbal, visual, and numerical material. The seven abilities identified to date are as follows:

1. *Number facility.* This is one of the most conspicuous primary abilities. "This primary factor is entirely restricted to numerical thinking, and is present in the highest amount in simple numerical speed tests. It is less conspicuous in those numerical tests which involve reasoning or formulation of a problem in quantitative terms."

2. *Word fluency.* "This ability is prominent in those tests in which the subject is asked to supply words in a given context. A test of anagrams has a large component of this ability. . . . Tests that signify this primary ability are limited to the recall of words, not sustained verbal reasoning."

3. *Visualizing.* Apparently this factor includes the visualizing of solid objects as well as flat space.

4. *Memory.* This factor was tested with a variety of materials, names, words, numbers, etc.; and tentative evidence is that a person can be described as having a good memory in general without specification as to what he can remember well.

5. *Perceptual speed.* This ability "is prominent in those tests in which the subject is asked to identify something quickly when it is mixed with other perceptual material. . . ." This is thought to be the ability which enables some people to scan a page of names and numbers to find a particular item quickly while others examine each item separately.

6. *Induction.* The subject uses this ability when, from several situations which have in common the characteristics he is to dis-

cover, he identifies the rule or principle which governs the several specific cases. Thurstone believes this ability closely approximates Spearman's g factor. He offers the hypothesis that certain persons may be superior in deductive thinking (going from the general to the particular) without being equally facile in induction.

7. *Verbal reasoning.* This ability "is exemplified by tests of verbal analogies, and tests in which the subject is asked to match proverbs which have the same moral or quotations which have the same meaning, and to make numerical estimates which require deductive reasoning."

Instead of trying to express an individual's "general intelligence" by a single score, we might appraise him with respect to each of the "primary abilities." Thurstone expects to refine the definition and measurement of these abilities, and to undertake research designed to reveal the extent to which they are "native" and to what extent they may be "trained." The possibilities of practical application of these data to educational and vocational guidance are alluring. One may soon be able to match his aptitudes with the demands which given activities make upon the differentiated factors of mental ability. It should be noted that Thurstone's analysis still deals with the abilities of primary concern in so-called "intellectual" rather than manual or socially oriented situations. Ultimately it will probably be possible to devise an elaborate psychograph for an individual, which will constitute a profile of his several abilities. This profile might well include not only his placement on tests of the type so far discussed, but on tests of special aptitudes, interests, attitudes, and personality traits.

INDIVIDUAL MENTAL TESTS

Binet's contribution. Alfred Binet, more than any other one person, has influenced the development of intelligence tests. Reference has already been made to the fact that, for the purpose of distinguishing between intellectually normal and subnormal school children, he turned from tests of simple sensory discrimination to measurement of complex mental operations. With Simon, he published his first test in 1905. It was composed of thirty tasks which

had been validated by use with groups of normal children from French schools, and groups of subnormal children in the special school at Sâlpêtrière. The tests ranged from simple tasks such as pointing to the nose to difficult ones like defining abstract terms. The individual tests were simply arranged according to difficulty. Binet employed fifty-nine tests for ages three to thirteen in the 1908 scale, and assigned these different tasks to age levels. Thus, the four-year-old tests were those passed by typical four-year-old children. He regarded a test passed by 60 to 90 per cent of a given age group as assignable to that age. Binet thus made concrete the concept of mental age. A child who passed all the tests up to and including those of age seven and no more was said to have a mental age of seven years. In other words, the mental development of an individual child was interpreted in terms of the intellectual ability of typical children in successive chronological age levels. Thus, a child with a mental age of ten years is as mentally mature as the average of ten-year-old children. If this child is ten years old chronologically, his mental growth is "normal." If he is younger than ten, he is advanced, and if older than ten, retarded in development. The concept of mental age is a major contribution to the psychology of mental development and the science of individual differences.

Binet published a second revision in 1911, the year of his death. It contained fifty-four tests to span the age levels from three to fifteen years. He provided five tests for each age group from three to ten (except for four at age four), five for age twelve, five at age fifteen, and five at the adult level.

Terman's revisions. Several revisions of the Binet scale have been made in this country, including those by Goddard, Yerkes, and Terman. The Stanford revision, first published by L. M. Terman in 1916, has been most popular. Terman's 1916 scale included six tests at each age level from three through ten, eight at age twelve, six at age fourteen, and six each at the "average adult" and "superior adult" levels.

Terman and Merrill brought out a new revision in 1936 designed to improve the scale, which had been particularly defective at the

extremes.¹ Two forms, equivalent in difficulty, range, reliability, and validity, are now available. They are said to cover a wider range, provide a richer sampling of abilities, and include, especially at the lower ages, more non-verbal test situations. Efforts to reduce the verbal material at the upper levels were relatively less successful, for at these points, says Terman, "major intellectual differences between subjects reduce largely to differences in the ability to do conceptual thinking, and facility in dealing with concepts is most readily sampled by the use of verbal tests."²

Terman points out that mental ages secured on the scale refer only to the results of that test, and may differ from those which might be secured from tests of musical ability, mechanical aptitude, or social adjustment.

The magnitude of the mental age unit of measurement shrinks as mental maturity is approached. Thus, the difference between a mental age of two and three is much greater than that between fifteen and sixteen.

In the new scale, there are six tests at each half-year from two to five inclusive; each test is equivalent to one month of mental age in computation of the score. From ages six to fourteen inclusive, there are six tests at each year with a mental age value of two months each. There are eight tests with two months' credit each at the "average adult" level; at superior adult I, six tests with four months' credit each; at superior adult II, six tests with five months' credit each, and at superior adult III, six tests with six months' credit each. The scale has thus been greatly extended at both extremes. The content still includes such tests as comprehension, absurdities, word-naming, drawing designs, memory for digits, giving differences and similarities, and defining abstract terms.

The intelligence quotient. Two children might have reached the same level of mental development, and yet differ greatly in brightness. To provide a measure of brightness, Terman, following Stern,

¹ L. M. Terman and M. A. Merrill, *Measuring Intelligence*. Houghton Mifflin, 1937.

² *Ibid.*, p. 5.

utilized the intelligence quotient, which is mental age divided by chronological age. A child with a mental age of nine and a chronological age of six would have an I.Q. of 150 (to avoid decimals the quotient is ordinarily multiplied by 100). On the other hand, one whose mental age is nine and whose chronological age is twelve has an I.Q. of 75. The latter child is rated as dull, and the one whose I.Q. was 150 as unusually gifted, for only one per cent of the population reach or exceed 130 I.Q. (on the 1916 scale). Yet the two have the same mental age, or have attained the same level of mental maturity. The intelligence quotient is also useful for predicting the individual's future mental development. Research has indicated that under "standard" conditions the I.Q. remains relatively constant. The child whose I.Q. is 150 may be expected to grow mentally eighteen months while the average child is growing twelve. The individual with an I.Q. of 75 will grow approximately nine months mentally while the average child grows twelve. Although the term "I.Q." has become common, it might be more indicative of the source of a score on the Stanford-Binet scale to call it the Terman-Binet quotient.

At the time he devised the original Stanford-Binet scale, Terman believed that adult mental age was approximately sixteen years. Therefore, chronological age of sixteen was used in computing I.Q.'s of persons sixteen years of age or older. The data secured during the standardization of the 1936 scale indicated that there was little improvement in mental age beyond the age of fifteen in the populations tested, and this is now the maximum chronological age to be used in determining I.Q.'s. Since the highest mental age which may be secured on the scale is twenty-two years and ten months, and the maximum chronological age to be used is fifteen, an adult may earn an I.Q. of 152. On the former scale, he could earn only 122.

Terman points out that "mental ages above thirteen years cease to have the same significance as at lower levels, since they are no longer equivalent to the median performances of unselected populations of the corresponding chronological ages. A mental age of fifteen years represents the norm for all subjects who are sixteen

years of age or older. Beyond fifteen, of course, mental ages are artificial and are to be thought of as simply numerical scores.”¹

Because mental ages for adults are not meaningful, it is increasingly common to provide percentile norms for intelligence tests at higher age levels. These tables show the score reached or exceeded by given percentages of the population upon which the test was standardized.

The evidence indicates that I.Q.’s computed from the 1916 Stanford-Binet scale were relatively constant from year to year only in the case of children whose initial I.Q. was approximately 100. To avoid the fluctuations which often occurred in dull and bright children, several substitutes for the I.Q. have been proposed. Heinis offered the personal constant.² He developed a curve of normal mental growth, and expressed increases in mental development as successive increments of a constant growth unit. Mental ages as secured from available intelligence tests and chronological ages as well are expressed in growth units, and the personal constant is the ratio of the first to the second.

Several tests have been devised to measure intelligence in young children. Kuhlmann extended the earlier Stanford-Binet scale as low as three months, and recently Goodenough, Foster, and Van Wagenen³ have published the Minnesota Pre-School Scale for very young children.

GROUP MENTAL TESTS

Uses and limitations. There is an obvious economy in such enterprises as education in testing a large number of subjects at one time with the services of a single examiner. Although psychologists were experimenting with group mental tests prior to that time, the World War provided an urgent need for means of testing many persons in a brief period. Psychologists devised for this purpose the Army Alpha test, a group examination which was administered to more

¹ *Ibid.*, pp. 30, 31.

² H. Heinis, “A Personal Constant,” *Journal of Educational Psychology*, vol. 17 (March, 1926), pp. 163-186.

³ F. L. Goodenough, J. E. Foster, and M. J. Van Wagenen, *The Minnesota Pre-School Scale*. Educational Test Bureau, Minneapolis, 1932.

than 1,750,000 men between September, 1917, and January, 1919. This test was based primarily upon the work of Otis and Terman, who were busy on a group intelligence test at the time. Since the war a large number of improved group tests have been constructed, and are in common use in schools.

One of the factors which contribute to the superior reliability and validity of the individual mental test is the examiner's effort to elicit proper attitude toward the test situation and effective coöperation of the subject. It may be that the group test is not as "pure" a measure of intelligence as the individual test because it is not possible for the examiner to secure proper rapport with every person. An individual may be fatigued, frightened, antagonistic, or physically unfit for the examination, and such conditions are likely to affect his score on the test. For group comparisons and rough individual classification, group tests are satisfactory, but where extremely reliable personal diagnosis is necessary, they should be followed by an individual test.

Most of the group tests devised for use with elementary and secondary school pupils are supplied with mental age norms, so that I.Q.'s may be derived. A pupil may be assumed to have a mental age of ten if his score on the test is equivalent to the median score made by an unselected group of ten-year-old children. Mental ages and I.Q.'s are not the same from one group test to another for the same person, however.

Materials included. The tasks or materials found in group tests are ordinarily selected from the following types:

1. *Opposites.* The subject is asked to indicate the opposite of a given word, or to determine whether two words denote opposite or similar ideas.

2. *Analogies.* Verbal analogies are most common, and are illustrated by the following: *cellar : attic :: bottom : (well, tub, top, house)*. Analogies may also be composed of geometric figures, as in Thurstone's Psychological Examination.

3. *Number completion.* This necessitates discovering the principle inherent in an arrangement of numbers and extending the series in accordance with the rule, as: 3, 4, 6, 9, 13, 18, —, —.

4. *Sentence completion.* This calls for supplying words in blanks to complete the sense of the statement, as: *The boy ——— two dollars to the Red Cross.*

5. *Vocabulary or word meaning.*

6. *Arithmetic problems.*

7. *General information.*

8. *Following directions.*

9. *Classification and generalization.* This task is illustrated by directions to cross out a word extraneous to a series, as: *Table—books, cloth, dishes, legs, top.*

Tests measure intelligence indirectly. If some general capacity called intelligence should exist, or a series of more specific aptitudes may be identified, these factors cannot be measured directly, but must be inferred from their operation in specific situations. What one measures is a product, the resultant of the individual's interaction with the environment. For this reason, measurement is one thing, and inference to intelligence another. As a matter of fact, much of the content of group intelligence tests, particularly for older children and adolescents, is drawn from instructional material. Are these tests not then achievement tests, or tests greatly influenced by specific learnings, instead of measures of underlying capacities? If all individuals tested have had equal opportunity to learn the content of an intelligence test, whether it be drawn from school materials or common environmental situations outside the school, the differences in product are assumed to represent *differences in capacity* of these persons to learn. What one gets from an intelligence test is not a quantitative statement of absolute amount of intelligence possessed by a subject, but his relative ability among other persons. The Stanford-Binet test avoids specific school content as much as possible, but it must also infer capacity from environmental adjustments of the individual. A test is valid to the extent that its situations are common to the environment of all children upon whom the examination is to be used.

Mental processes employed. Woodworth considers it more instructive to determine what commonly used mental tests actually measure than to indulge in academic attempts at definition of in-

telligence.¹ His analysis reveals that the following mental processes are ordinarily involved in success on the tests:

1. "Many items, such as the vocabulary test, require the use of knowledge previously acquired. To this extent, then, the test score depends on the ability to learn and remember and on a wide-awake interest in the environment."

2. "The test items, however, do not usually call for mere memory, but rather for applying knowledge to a new problem."

3. "Many items depend on 'seeing the point,' on picking out the essentials of a problem. . . ."

4. "Breadth of view is demanded." This means, essentially, seeing the task as a whole, and includes foresight.

5. Discovery of relationships. This is closely related to breadth of view. "Indeed, breadth of view means seeing the whole situation as a pattern of interrelated parts."

PERFORMANCE TESTS

Performance tests are devices for the measurement of intelligence without use of verbal materials. They are tests of ability to *do* things rather than to give verbal responses. The form board, one of the commonest types of performance tests, calls for fitting blocks of different shapes into corresponding holes. It is therefore a test both of perception and of correct motor response. Time of performance and errors are significant in the score. A more complex reaction is demanded in tests where objects and geometric designs cut in pieces must be put in their appropriate places. The manikin test is one in which the subject must put together arms, legs, head, and body to form a man. In the feature profile test, the examinee has to put pieces together to form a head. The ship test calls for assembling ten pieces of the same size cut from a picture of a ship, and placing the parts in a rectangular frame. In a picture completion test, the subject is required to select the proper block out of many possible ones to complete a picture. These tests demand not only accurate perception of form and correct motor response, but the ability to see the situation as a whole, and to make the parts

¹ *Op. cit.*, p. 81.

conform to the inclusive pattern. They also apparently tap skill in using non-verbal material for problem-solving.

Pencil mazes, substitution tests, cube construction tests, copying designs, and mark-out exercises are other devices for measuring performance. The Army Beta examination, used to test foreign-speaking and illiterate recruits, is a battery of ten pencil and paper performance tests. This examination was given almost entirely without verbal directions by means of gestures and blackboard demonstrations. Rockwell standardized a non-verbal perception test for pre-school, kindergarten, and first grade children which requires the examinees to place actual objects in proper holes.

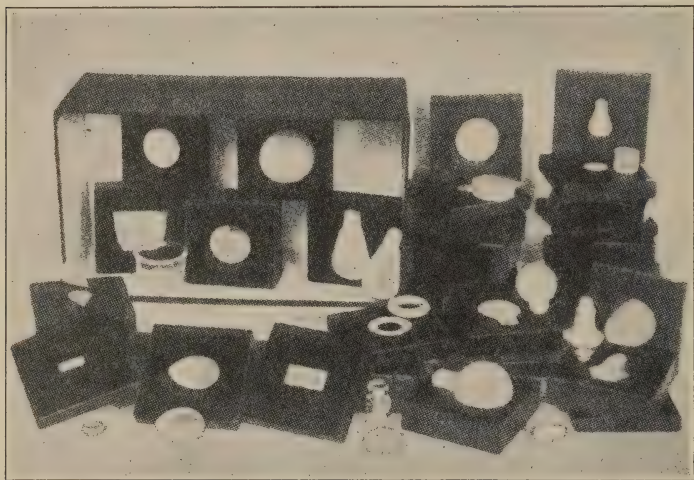


Fig. 8. THE ROCKWELL NON-VERBAL PERCEPTION TEST ¹

Mental age norms have been determined for several of the well-known performance scales, and some of them give I.Q.'s which approximate those obtained from the Kuhlmann extension or from the Stanford revision of the Binet scale for younger children. For the most part, however, performance tests should be used to supplement verbal examinations, for a more inclusive analysis of abilities,

¹ From A. C. Eurich and H. A. Carroll, *Educational Psychology*, p. 98. Heath, 1935.

or where the use of language tests is impossible. Their principal value lies in use with very young children, persons who do not speak English, the deaf, individuals with speech defects, or those whose language development has been abnormally restricted by environmental circumstances.

Measurement by drawings. Goodenough has shown that intelligence may be revealed by children's drawings.¹ Subjects are told simply to "Make a picture of a man. Make the very best picture you can." The examiner rates the drawings by a scoring scale of 51 points. Artistic qualities, or their lack, in the drawings are disregarded. The child's score depends upon the presence or absence of such fundamental parts as legs, arms, eyes, nose, mouth, fingers; by arms and legs fastened to the trunk; and by proper relationships and proportions. The author gives mental age norms from three to thirteen years, and reports that I.Q.'s derived in the usual way correlate well with those obtained from the Stanford-Binet scale. The characteristics of children's drawings from age to age reveal interesting maturational changes which are probably related to intelligence. For instance, the first articulate drawings of children seem to emphasize general form, or global totals, and to slight detail. With maturation, these general impressions seem to break into more analytical perception of items and relations, and the drawings become more detailed and true to the objects and situations.

GROWTH OF INTELLIGENCE

Growth curve. Psychologists have secured most of their data concerning the growth of intelligence from the use of performance tests and developmental behavior schedules with very young children and from Stanford-Binet and other verbal test scores with older subjects. The difficulty of determining the shape of the mental growth curve is complicated by the fact that we do not have a zero point, and by the difficulty of securing a constant unit of mental measurement. In other words, we do not know from our present scales whether a year's mental growth from eleven to twelve

¹ F. L. Goodenough, *Measurement of Intelligence by Drawings*. World Book Company, 1926.

is equivalent to that registered from ten to eleven. The bulk of evidence, however, points to a negatively accelerated curve something like the hypothetical one shown in Figure 9. This curve shows a very rapid rise and then steadily decreasing increments with increases in chronological age.

Limits of growth. How long does intelligence develop? The evidence, still somewhat meager, comes from two sources: (1) retests

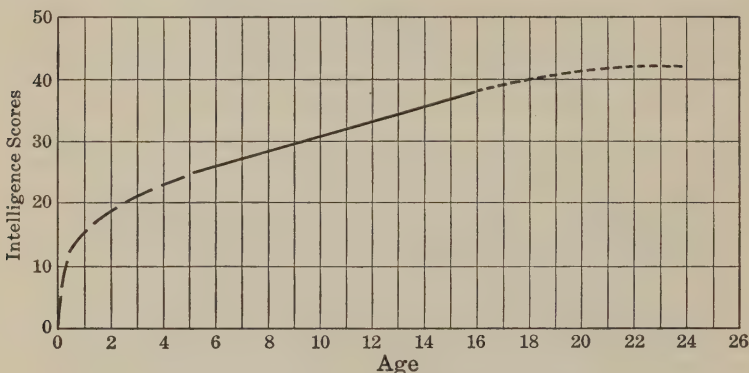


Fig. 9. COMPOSITE GROWTH CURVE ¹

The spaced part of the line is based on the work of Gesell; the solid part, upon numerous measures of growth as taken with a group and individual intelligence tests; and the dotted part, upon the work of Thorndike.

of the same individuals, and (2) tests of samples of the population at successive age levels. Terman has found, as already noted, that in a relatively unselected population, mental growth increments are slight after the age of fifteen. But this finding is contrary to common observation and experience. It is possible that a more productive stimulus to development in the later teens and early twenties would result in longer growth than that which Terman found. It is also entirely possible that psychologists have not yet succeeded in devising tests able to detect growth increments at the more mature levels.

One must remember that Terman's data show that the "average" individual does not grow perceptibly in intellect after fifteen.

¹ From A. M. Jordan, *Educational Psychology*, p. 341. Holt, 1933.

Many individuals will deviate from this norm. Several studies probably based upon somewhat selected groups at upper age levels have placed the apogee of growth of mental capacity at from twenty to twenty-two.

One study reported retest data which suggested that mental development continued well beyond seventeen or eighteen years. Another indicated that although mental growth of the subjects (who had I.Q.'s above 132) increased to the age of nineteen, subsequent increments would be slight, if any. Two other investigators reported decided gains in college students from ages eighteen to twenty on the Thorndike Intelligence Examination for high school graduates, a gain which they arbitrarily ascribed to the invalidity of the test as an intelligence examination rather than to increase of capacity. Several other studies show substantial gains in intelligence test scores of college students from the freshman to the senior year.¹ McConnell² found that retest data on the Thurstone Psychological Examination over that period for seventy-five students showed an average gain of forty points, some but by no means all of which he thought might be ascribed to the effects of specific training. Two students in the group gained as much as one hundred points. He could find no evidence that they were abnormally handicapped by physiological, emotional, or environmental conditions at the time of the first test, or that they were unusually motivated at the retest. The records of these two individuals showed a constant and rather surprising gain in achievement and in effectiveness of mental performance throughout the four years. The burden of the evidence from repeated tests of college students is that increments of intelligence can be detected at this period. One must remember in accounting for this growth that college students are a selected group of the total population and that they are subject to a stimulating intellectual environment.

¹ See summary and bibliography in F. D. Brooks, "Mental Development in Adolescence," *Review of Educational Research*, vol. 6 (February, 1936), pp. 85-101.

² T. R. McConnell, "Changes in Scores on the Psychological Examination of the American Council on Education from the Freshman to Senior Year," *Journal of Educational Psychology*, vol. 25 (January, 1934), pp. 66-69.

Thorndike found that the peak of ability to learn occurred somewhere between the twenty-second and twenty-fifth years and declined slowly thereafter to age forty-five.

Decline of abilities. The fate of man's abilities with age is an intensely interesting subject. Because it is difficult to secure comparable samples at different age levels for testing purposes, it is a problem upon which the data are still insecure. Certain findings, however, may be summarized tentatively as follows:¹

(1) The curve of growth of mental ability "in general" reaches its peak at about twenty, falls off gradually from twenty-five to forty-five, and more rapidly thereafter.

(2) When fairly comparable age groups chosen from the population of certain New England rural districts were tested by the Army Alpha, the curve of growth based on three sections of the examination which measured information mainly remained practically level from twenty to sixty; the curve on sections the scores in which depend principally on "alertness and mental flexibility" dropped off rapidly from its maximum at seventeen years, reaching at age sixty a level approximating that attained at age ten.

Other studies have lent plausibility to the hypothesis that much of the intellectual efficiency of mature persons is due to superior knowledge and experience, and possibly to better habits of intellectual application.

(3) The vocabulary test scores of adults tested at five-year intervals to age fifty-five showed the peak of development at the highest age tested. Test-makers have considered vocabulary exercises as highly useful indices of intelligence of school-aged persons. They may not be fundamentally valid for the same purpose in the case of adults.

(4) The peak of development and the rate of decline vary considerably for different specific abilities. Some abilities show no appreciable decline before late middle age. Decline sets in earlier and more rapidly in the more purely anatomical and physiological

¹ F. D. Brooks, *op. cit.*; W. R. Miles, "Age in Human Society," in Carl Murchison (Editor), *Handbook of Social Psychology*. Clark University Press, 1935.

functions, such as sensory acuity and sensori-motor coördination. It is less evident in predominantly intellectual functions. Speed is more susceptible to deterioration with age than quality of performance. Memory declines more rapidly than imagination and judgment. There are many individual differences both in growth and decline. Many persons in the later decades of life will perform some tasks as well as the average of the population one or even two decades younger. It has been asserted that it is the loading of mental tests with the speed factor that gives the appearance of decline with age, and that there is in fact rather small loss of intellectual power.¹

(5) Adults are probably at a disadvantage in intelligence tests because they experience less and less the situations used in such examinations.

(6) Thorndike ascribes the reduction in learning by adults more to decrease in interest in new adjustments than to decline in ability.

(7) The old experience difficulty with learning which conflicts with well-established habits, or which necessitates a new combination of them.

After the time when inner growth or maturation ceases to contribute to human capacity, man may sustain or even increase his efficiency in performance by expanding his knowledge and understanding, and bring them to bear directly on his problems, and by utilizing more effectively in adjustment the abilities which he possesses. Youth should take into maturity expanding interests; energizing motives and goals; competent techniques of learning; and attitudes of tolerability of change, of self-criticism, and of open-mindedness. These are the determiners of the aggressive life. "Most people's mental abilities begin to decline with their graduation from high school or college," writes one psychologist, "unless a vigorous post-school environment demands active mentation."²

Inheritance of mental ability. Do individuals inherit their mental

¹ Irving Lorge, "The Influence of the Test upon the Nature of Mental Decline as a Function of Age," *Journal of Educational Psychology*, vol. 27 (February, 1936), pp. 100-110.

² Herbert Sorenson, "Mental Ability over a Wide Range of Adult Ages," *Journal of Applied Psychology*, vol. 17 (December, 1933), pp. 729-741.

capacity or capacities? Can we change an individual's intelligence by changing his environment—for example, the type of school training he has, or the kind of home he lives in? In other words, does intelligence develop in relative independence of the environment, or is it sensitive to rather narrow changes in stimulation?

Answers to these questions must be tentative at the present time. We must exercise many cautions in interpreting the incomplete data available. In the first place, we must remember that when we speak of intelligence or mental abilities, we restrict the meaning of these terms to "what the tests measure." Second, "nature" and "nurture" are inextricably intertwined from birth onward, and it is impossible to say, for a given function in a given individual, how much is due to heredity and how much to environment. Since growth is always the resultant of hereditary potentials and environmental stimuli, performance is a complex, an inseparable complex, of the two. Third, to secure conclusive data, it would be necessary to hold environment constant and vary heredity, and also to hold heredity constant and vary environment. It is not only difficult to assess the heredity of cases studied (except perhaps in the case of identical twins),¹ but it is next to impossible to define environment for human organisms (what one reacts to, for instance, is not merely a condition of external stimulation, but of the individual's motives, emotional dispositions, and ideational sets at the moment).

Blood relationships. The extent of correspondence of mental ability among individuals of different degrees of blood relationship is one line of evidence for hereditary influence. These data are given in terms of coefficients of correlation. For our present purpose, we may define the coefficient of correlation as a quantitative statement of the degree of relationship between two sets of variables. If the two distributions vary together directly and perfectly, the coefficient is $+1.0$. If they vary perfectly, but inversely, the coefficient is -1.0 . The relationship which chance alone would give

¹ Identical twins are always of the same sex and are thought to be produced from the fertilization of a single egg. Their hereditary composition should thus be identical.

is 0. Coefficients of correlation vary, then, from -1.0 through 0 to $+1.0$. It must not be assumed that a coefficient of correlation of .5 indicates half-perfect correspondence. The extent of relationship may be interpreted in terms of the improvement over a chance relationship which a given r (symbol for product-moment coefficient of correlation) represents. This is given by the expression $1 - \sqrt{1 - r^2}$. If one substitutes .5 for r in this formula, he finds that this degree of relationship is about 13 per cent more than chance would give. Thus, r must reach .866 before a 50 per cent advantage is obtained. An r of 1.0 would, obviously, represent perfect correspondence or 100 per cent better than chance relationship.

Blood relationships in intelligence ordinarily found approximate the following:

Identical twins.....	.90
Like sex twins.....	.80
Fraternal twins.....	.70
Unlike sex twins.....	.60
Siblings.....	.50
Parent and child.....	.30
Cousins.....	.27
Unrelated children.....	.00

A coefficient of .5 is small enough to allow decided differences among offspring of the same parents. In other words, siblings vary around the norm of their parents, not around the norm of the population. Furthermore, the inheritance is not from the parents alone, but from the ancestral line. It would be erroneous to interpret these coefficients as expressing likeness due to heredity alone, for environmental factors are caught up in them as well.

It has been customary for hereditarians to offer as evidence of the power of inheritance the preponderance of defective, normal, or exceptional descendants in family lines. One of the notorious exhibits is the Kallikak family. Of 480 descendants of the illicit mating of Martin Kallikak, a soldier in the Revolutionary War, with a feeble-minded woman, only 46 were considered normal. From a legitimate mating of the same man and a normal woman, 496

direct descendants were identified, of whom only 5 were not normal.

The presence of many distinguished persons among the 1394 descendants of Jonathan Edwards traced to the year 1900 is frequently cited as evidence of the inheritance of superior capacity: 295 were college graduates; 15 became college presidents; 60, physicians; 100, clergymen; 75, military officers; 60, prominent authors; 100, lawyers; 30, judges; 80, public office holders, and so on.

Terman¹ found that $22\frac{1}{2}$ per cent of 62 members of the Hall of Fame were related to 643 gifted children whom he studied in California.

To ascribe either the degeneracy of the Kallikaks or the eminence of the Edwards line indiscriminately to the effect of heredity, however, is definitely misleading. To account for both defective and superior strains, one must consider environment as well as heredity. The normal members of the defective Kallikak strain were born almost invariably into unfortunate environments. The least capable of the Edwards family usually profited from the stimulus of superior home, educational, and community advantages. In view of these complicating factors, the relative influence of which can hardly be determined, it seems wise not to consider the evidence from either the Kallikak or Edwards family to have much scientific validity with respect to the problem of hereditary versus environmental determination of intelligence.

Terman found that his gifted school children came from superior homes and had better educated parents and relatives than the average child. They were undoubtedly fortunate, not only in heredity but also in environment. Several attempts have been made to determine the relative influence of heredity and environment in accounting for individual differences in intelligence. Some of these studies will be reported in Chapter IX.

Constancy of I.Q. The general finding that on repeated Stanford-Binet tests the individual's I.Q. tends to be relatively stable has been used to support the position that intelligence develops almost independently of school, home, and other environmental condi-

¹ L. M. Terman, *Genetic Studies of Genius: Vol. I, Mental and Physical Traits of a Thousand Gifted Children*, p. 91. Stanford University Press, 1925.

tions. Recent researches, however, indicate that one should expect the I.Q. to remain stable under "standardized" or "ordinary" environmental conditions.

Wellman¹ found that pre-school attendance was associated with substantial gains in I.Q. She found (1) marked increases in I.Q. on repeated tests during pre-school and elementary school attendance in the University of Iowa experimental schools; (2) pre-school children gained during the school year, but not during the summer vacation; (3) greatest gains were made by children in the lower levels of I.Q.; (4) those who attended pre-school longest made greatest gains; (5) those who left the experimental schools retained gains already made but did not continue to gain; whereas those who remained in the experimental school tended to gain throughout the period. This study has aroused widespread interest, partly because its results differ greatly from those of other researches, and it has not been received without criticism. If valid, the data call for a revision of traditional views of the growth of intelligence.

Wellman's data indicate that more than expected amounts of mental growth may be stimulated by a "preferred" environment. This does not imply, of course, that heredity does not determine the limits of mental development. But it does suggest that the extent to which native potentialities are actually realized is conditioned by the number and character of stimuli to growth. Thus, one finds the hypothesis "that inherited mental capacity, if allowed to function below its response potentialities, decreases relatively (that is, the intelligence quotient declines)." ² The same writers point out that "there are strong forces definitely subversive of mental development in individuals, in that they are substitutes for thinking or distractions designed to discourage the process."

¹ B. L. Wellman, "Effect of Pre-School Attendance upon the I.Q.," *Journal of Experimental Education*, vol. 1 (December, 1932), pp. 48-69.

Idem, "Growth in Intelligence under Differing School Environments," *Journal of Experimental Education*, vol. 3 (December, 1934), pp. 59-83.

² G. D. Stoddard and B. L. Wellman, *op. cit.*, pp. 178, 179.

SPECIAL GROUPS AND RELATIONSHIPS

Feeble-mindedness. Sociologically, a feeble-minded individual has been defined as one who, as a result of arrested or imperfect mental development, "is incapable of competing on equal terms with his normal fellows or managing himself or his affairs with ordinary prudence." It is obvious that within this definition an individual might be considered normal in one period who would be classed as defective in a more complex society, or that the same person might be normal in one environment and deficient in another. Psychological distinctions have used the mental age concept. Thus, idiots are "those so deeply defective that the mental development never exceeds that of a normal child of about two years." "Imbeciles are those whose mental development is higher than that of an idiot but does not exceed that of a normal child of seven years." Morons are said not to develop beyond the level of a normal twelve-year-old. In terms of I.Q., idiots grade approximately from 0-25; imbeciles, from 25-50; and morons, from 50-70. The difficulty with this classification is that it is entirely arbitrary; that it violates the fact of continuous distribution of traits, as do all classifications into types, and that the distinctions are made with reference to only one of several possible criteria of intelligence. The classification must be considered as suggestive only, and the descriptions in the following paragraph should be thought of as general group characteristics, not as descriptions of individual cases.

Idiots cannot learn to talk, to avoid the common dangers of life, to wash or dress themselves, and the lowest of them cannot care for bodily needs. Imbeciles rarely learn to read and write, and can do only the simplest tasks. They cannot acquire the ability to do useful work, and need constant direction. The moron, however, can usually learn to read and write, and manage routine tasks under supervision. The highest members of this group sometimes are able to do simple unskilled work for remuneration. In every case, however, they need supervision and direction, not only in their work but particularly in leisure time, for they are easily led into delinquency. It has been found that a group of feeble-minded who

had adjusted successfully outside an institution "had slightly better heredity, were from better homes, had more favorable personality traits, were those for whom recommendations made were carried out, and were better supervised." ¹

Tests indicate that the dull child is not equally deficient in all respects. Verbal functions often show more inferiority than manual performance. In school, the high-grade feeble-minded are more deficient in reading, composition, and arithmetic than in penmanship, drawing, handwork, and spelling.

Although mental defectives are slightly inferior to the normal population in physical development, such as height, weight, and general health, there are no consistent physical stigmata which are diagnostic of higher levels of feeble-mindedness. After long experience in distinguishing between mentally normal and defective persons by use of intelligence tests, Binet wrote that nothing is as deceiving as the physical appearance of intelligence, and that it is necessary to react consciously against "instinctive" impressions of ability. Of course, in the case of microcephalics, individuals whose brains remain abnormally small; Mongolian idiots, who develop definite Mongoloid features; and cretins, whose development is arrested by insufficient action of the thyroid gland, characteristic structural defects are indicative of mental deficiency.

Intellectual superiority. Careful studies of gifted children have exploded the old impression that superior intelligence was likely to be associated with physical inferiority, social maladjustment, and neurotic tendencies. Terman ² compared the characteristics of 643 gifted school children all but twenty-two of whom had I.Q.'s of 140 or above (representing approximately the upper one per cent of the elementary school population) with those of an equally large number of average children. Anthropometric measures showed the gifted children to be physically superior. Their general health was better. They were 14 per cent better than the average in actual

¹ See discussion and bibliography in Gertrude Hildreth, "Applications of Intelligence Testing," Chapter II in *Psychological Tests. Review of Educational Research*, vol. 5 (June, 1935).

² *Op. cit.*

grade classification, and 40 per cent better than the age norms on the Stanford Achievement Test. Their play interests were comparable to those of average children, except that they were likely to be more mature. Other interests were no narrower or more specialized than those of normal children. The gifted group was particularly precocious in reading and language ability. Their range of reading was wider, and they read more books. They read more science, history, biography, travel, folk tales, informational fiction, poetry, and drama and fewer books of adventure, mystery, and emotional fiction than the control group. Personality tests showed them to be slightly superior to the average group. They were higher in desirable social attitudes and in trustworthiness. The gifted group seven years after the initial study were still better adjusted than the average group in personality traits, had in general realized the "promise of youth" in academic achievement, and had almost maintained the original level of I.Q.

Thorndike's test for Intellect *CAVD* was administered to twenty-one adults who had been tested in childhood (ages 5.0 to 9.9 years) with the Stanford-Binet.¹ There was a high relationship between their original level and their *CAVD* scores at maturity. (The correlation was .85.) Five of the individuals who had I.Q.'s of 180 or above in childhood had made some creative contribution before the age of twenty-two. One had done research in history, one in mathematics, and one in chess. Two had become established in the professions. All but one had been elected to Phi Beta Kappa. It was discovered in the study that persons with an I.Q. of 190 in childhood break through the "ceiling" of available tests of adult intelligence by the age of twenty-one. The authors reported that children of 140 I.Q. and above fall within the upper one-fourth of the college graduate population at maturity, and that an I.Q. of 160 seems to be necessary to win honors in a first-class college.

There were individual exceptions, as would be expected, from the general tendency for positive correlation of desirable traits in the gifted. Some who were high in "general intelligence" tested

¹ Irving Lorge and L. S. Hollingworth, "Adult Status of Highly Intelligent Children," *Journal of Genetic Psychology*, vol. 49 (September, 1936), pp. 215-226.

much lower on special aptitudes. But nowhere in the data, either on the gifted or the inferior, is there any evidence for the popular and comforting theory of compensation.

Schools have failed to nurture adequately the resources of superior and gifted children. That this has led to tremendous wastage in achievement, and perhaps even in underlying mental growth, is increasingly evident. The social loss of this relative indifference to talent must have accumulated to tremendous proportions. Educational agencies cannot discover superiority too soon, or foster its balanced development too assiduously.

Intelligence and school success. The relationship between intelligence test scores and school achievement is low enough to allow for the effect of many other factors on scholarship. At the elementary school level, correlations computed between verbal intelligence tests and school marks have ranged from about .30 to .60.¹ Gates² found a mean correlation of .54 between intelligence scores and a composite of achievement tests in grades 3-8. The relationship between mental test scores and achievement as measured by objective examinations is usually higher than when teachers' marks are used. Correlations of intelligence and achievement test scores in the intermediate grades ranging from .73 to .80 were recently reported.³

The average correlation found between intelligence and school marks at the secondary school level is also between .40 and .50. Correlations computed with college grades range from .30 to .65. The average, however, is again about .45. When the results of actual achievement during the first year of college work are combined with intelligence test scores future college success is predicted much more accurately than from the intelligence test alone.

The relatively low correlation between intelligence test scores

¹ Rudolf Pintner, *Intelligence Testing*, p. 267. Holt, 1931.

² A. I. Gates, "The Correlations of Achievement in School Subjects with Intelligence Tests and Other Variables," *Journal of Educational Psychology*, vol. 13 (1922), pp. 129-139; 223-235; 277-285.

³ M. E. Broom, "Measuring Mental Ability in the Intermediate Grades of the Elementary School," *School and Society*, vol. 35 (March 5, 1932), pp. 323-324.

and school achievement is due to many factors, of which the following are particularly significant:

1. Teachers' marks are based on many other factors than achievement alone.

2. Teachers' marks express whatever criteria they *are* based on very imperfectly.

3. Achievement tests have measured mainly factual outcomes of instruction—and those rather poorly. More subtle results of learning, such as understanding and application of principles, relations among ideas, and so on, seldom appear in the tests.

4. Achievement tests measure whatever they *do* test very imperfectly.

5. Intelligence tests are obviously not purely tests of intelligence, and they are also inherently unreliable in application.

6. Other factors than intelligence, such as attitudes toward teachers and courses, habits of study, previous training, interests, and industry, influence achievement.

7. Schools seldom stimulate students of superior ability to correspondingly high achievement.

Reasons for failure. Many college students fail, not because of insufficient capacity, but because they employ their capacity ineffectively. The most frequent cause of failure in college is poor reading ability. Reading ability itself is related to intelligence, but there are, nevertheless, many persons who, because of inadequate training and limited experience, read at a level of speed and comprehension far below their possible attainment.

Students should appraise the effectiveness of their study habits in the light of what psychologists know about economical methods of memorizing, understanding principles and laws, apprehending relationships, and solving problems. One of the purposes of this volume is to give specific directions for learning based on sound psychological principles. Success in specific subjects such as foreign language or mathematics often depends on use of study techniques specifically adapted to those materials. Knowing how to use the library, what sources are useful in acquiring information in a wide range of topics, how to take notes on reading, and how to combine material from

many sources into a well-organized comprehensive outline are critical factors in scholastic success. Inability to express ideas accurately, economically, and interestingly is a tremendous obstacle to achievement in college, and very often in life. Studies show conclusively that college students can improve their reading and study procedures by well-directed practice. Everyone should make a deliberate diagram of his abilities and disabilities in the psychological laboratory, and take specific steps to improve his learning tools where possible. It is one of the functions of college and university to provide the opportunity for analysis and improvement.

Intelligence and delinquency. Recent investigations have refuted the older opinion that a very large percentage of juvenile delinquents are feeble-minded. The median percentage of feeble-mindedness in a series of studies was 13.¹ This is, of course, a greater proportion than that of the general population. Healy and Bronner believe that the incidence among delinquents is five to ten times that in the population as a whole.² Recent studies have revealed average I.Q.'s of 88.2, 82.2, and 79 in groups of delinquents.³ In most of the investigations made to date the average I.Q.'s range from 76 to 90. The curves of distribution are skewed toward the lower end—there are relatively few cases of highly superior ability represented.

It is clear then, that while low intelligence may dispose the child to delinquency, it is by no means the sole or the principal cause. The deviation from the usual in personality and character is much greater. The delinquent is inferior in emotional stability, self-control, and knowledge of social and moral standards. Environmental influences are potent. One study showed that 45.2 per cent of delinquent children, as against 19.3 of normal groups, came from homes where divorce, separation, or death had disrupted the normal mental states of the parents. Crime and delinquency are closely associated with various types of residence areas in cities. The influence of gangs, family history of vice or crime, absence of recrea-

¹ P. A. Witty, "Intelligence: Its Nature, Development, and Measurement," in C. E. Skinner (Editor), *Educational Psychology*, p. 476. Prentice Hall, 1936.

² William Healy and A. F. Bronner, *Delinquents and Criminals, Their Making and Unmaking*. Macmillan, 1926.

³ Gertrude Hildreth, *op. cit.*, pp. 204, 205.

tional facilities, unfortunate relations of children and parents, detrimental interests, movies—all bulk large among the factors leading to delinquency. Lack of adjustment between capacity and school work is another significant factor. Too much mental luxury is as dangerous as constant failure at tasks too difficult.

Control of delinquency is even more a matter of social and economic, educational, and moral adjustment than of eugenic improvement.

SPECIAL APTITUDES

Mechanical aptitude. Musical and artistic aptitudes, and possibly mechanical aptitude, appear to be relatively independent of abilities measured by common verbal intelligence tests. The authors¹ of the Minnesota Mechanical Ability Tests report that scores on those tests are not closely related to environmental influences, and offer the hypothesis that differences among individuals in mechanical aptitudes are mainly innate. Among the tests which these psychologists found most useful in predicting mechanical ability were the Minnesota Paper Form Board, the Minnesota Spatial Relations Test, and the Minnesota Assembly Test. One of four sheets of the Form Board is reproduced in Figure 10. The examinee draws lines to show how he would fit the small figures into the large one. Three form boards like the one shown in Figure 11 (see page 200) compose the spatial relations test. The subjects attempt to fit blocks into the spaces cut out in the board. The Minnesota Assembly Test consists of three boxes containing dissembled mechanical devices. Box A contains the following articles: expansion mit, hose pinch clamp, Hunt paper clip, wooden clothespin, linked chain, bottle stopper, push-button doorbell, bicycle bell, Corbin rim-lock, and coin purse. The task is to assemble properly the parts of each device.

Correlations found between verbal intelligence and mechanical aptitude have ranged approximately from $-.30$ to $.30$, but have tended to hover around zero.

Artistic aptitudes. Musical and graphic aptitudes probably re-

¹ D. G. Patterson, R. M. Elliott *et al.*, *Minnesota Mechanical Ability Tests*. University of Minnesota Press, 1930.

quire fortunate combinations of a number of specific mental factors which, within the individual, may vary independently among them-

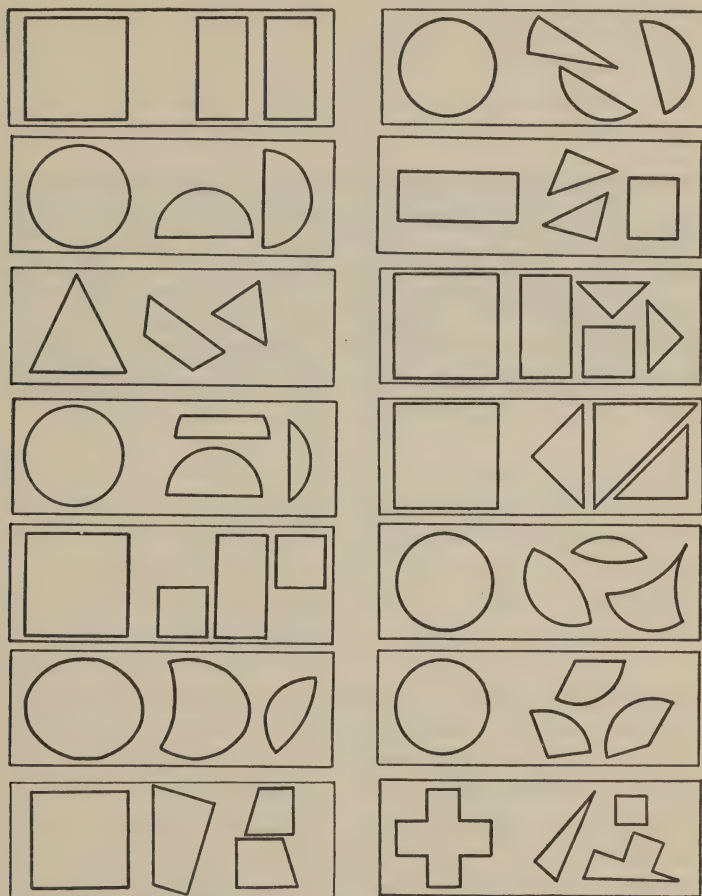


Fig. 10. THE MINNESOTA PAPER FORM BOARD TEST: SERIES A ¹

selves and independently of verbal ability. At the present time, artistic ability must be inferred from measurements of art judgment or art appreciation rather than from tests of creative ability itself.

¹ From A. C. Eurich and H. A. Carroll, *op. cit.*, p. 110.

We may expect persons with creative ability in art to have good judgment and appreciation; on the other hand, one might do well on a test of appreciation but have little creative ability.

The Meier-Seashore Art Judgment Test consists of pairs of pictures, the two pictures in each pair being alike except in one respect. The subject is told in what respect the two differ, and is asked to choose the better of the two. The McAdory Art Test is composed of

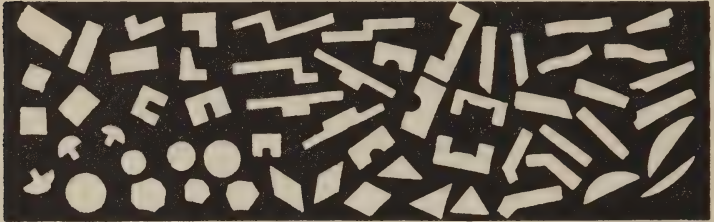


Fig. 11. THE MINNESOTA SPATIAL RELATIONS TEST: BOARD A ¹

seventy-two plates, each of which presents four illustrations of the same subject (articles of furniture, utensils, textiles, clothing, architecture, painting, etc.) treated in slightly different ways. The subject indicates his first, second, third, and fourth choices.

Intelligence as measured by the Miller Analogies Test was found to correlate to the extent of .10 with the McAdory Art Test, and .26 with the Meier-Seashore Test. Investigators compared a group of intellectually superior and a group of very dull junior high school pupils on the McAdory Art Test, and found a substantial difference in means, but a great overlapping of the distributions of the two groups. Sixty-three per cent of the dull children exceeded the lowest score made by the gifted. Only nine per cent, however, exceeded the mean of the superior. The investigators state that when intelligence exists in excess, as in the case of the gifted, it precludes the possibility of an unusually low score in the art test. When it is deficient, as in the case of the dull or feeble-minded, it does not preclude the possibility of a comparatively high score.²

¹ From A. C. Eurich and H. A. Carroll, *op. cit.*, p. 111.

² *Ibid.*, p. 184.

Both art and musical aptitudes are probably not simple abilities, but complexes of many factors. Seashore has devised tests of six phases of musical talent: pitch discrimination, intensity, time, consonance, tonal memory, and rhythm. The tests are recorded on six double-disk phonograph records. On the basis of extensive studies, Seashore believes that the abilities measured are primarily innate, and but little susceptible to specific training. The test, however, is mainly negative in value. That is, an individual who scores low on the several parts has little chance of musical attainment, but high scores are not certain indications of success.

Correlations between musical aptitude and verbal intelligence tests, as in the case of mechanical and artistic abilities, hover around zero. Psychologists point out, however, that distinction in the arts probably involves not only the presence of special aptitude but possession of superior ability as measured by the so-called general intelligence tests as well.

Other aptitude tests. For purpose of prognosis, or prediction of achievement in school subjects, professional study, and vocational activities, many other aptitude tests are available. These examinations frequently include, not only sections designed to measure basic capacities involved in the fields in question, but also parts which measure specific training essential for successful future attainment.

Tests useful for indicating scholastic, vocational, and professional aptitudes will be commented on in Chapters XI and XVIII. Despite the many aptitude and achievement tests, interest inventories, and scales of personality traits now available, one cannot obtain a completely reliable index of vocational and educational aptitude. But educational and occupational choices based upon a relatively complete test profile of the individual's characteristics will have a much greater degree of promise than many of the casual decisions which individuals so frequently make.

QUESTIONS

1. Explain: Intelligence must be inferred, rather than measured directly.

2. Explain: Intelligence tests give measures of relative aptitude rather than absolute amounts.
3. Why is it that group intelligence tests and achievement tests do not measure entirely different things?
4. Criticize the use of term "general intelligence test."
5. How is Thurstone's attempt to identify primary mental abilities different from early efforts to measure intelligence?
6. Distinguish between mental age and brightness.
7. Of what value in education is the knowledge that the I.Q. tends to remain relatively constant?
8. What is the difference between age norms and percentile norms?
9. Analyze some available group mental test for materials used and functions measured. Refer to the discussions of these topics in the text.
10. The author of a widely used group mental test recently said: "An individual's score on the test represents his ability to complete certain verbal analogies at a given time and under given external and subjective conditions." Why is it wise to be so cautious about the meaning of mental test scores?
11. Could one confidently use verbal aptitude tests and performance tests to measure the same capacities?
12. What are the social and educational implications of the data concerning adult abilities?
13. Criticize the assumption that intelligence is the product of an intrinsic growth process which reaches its potential level without respect to quality of the environment.
14. How justifiable do you consider the statement that gifted students can take care of themselves in the schools?
15. Are individuals who have relatively low verbal aptitude among persons of the same age almost certain to have correspondingly high scores on measures of mechanical aptitude? May they be relatively superior in mechanical aptitude?
16. What evidence is there for the occurrence of special aptitudes?

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CHAPTER IX

INDIVIDUAL DIFFERENCES

NATURE AND EXTENT OF INDIVIDUAL DIFFERENCES

The fact that individuals differ from one another in many traits, psychological as well as physical, is now generally accepted. The layman, however, is often misinformed concerning the nature and causes of the variation, and often underestimates the magnitude of the differences. There is still, for example, a widespread belief in types (a fallacy for which psychologists themselves, unfortunately, have been greatly responsible). Many persons make dogmatic assertions about the intellectual inferiority of certain racial groups, although the careful scientist makes only very tentative generalizations from the relatively meager data now available. Extreme hereditarians often have implied that the individual reaches his mental level irrespective of the quality of the environment. Not a few persons have assumed that not only intellect and temperament, but nearly all phases of personality, and even morality, are inherited. The environmentalists have often talked as if training and experience accounted almost as completely for human variation. The extreme behaviorists, for example, have declared that all the individual inherits is a set of reflexes; all other traits are the product of nurture. Unfortunately, the wishful thinking of the layman and parent was encouraged by a claim which runs counter to all that the biologist has discovered about genetics: "Give me a dozen healthy infants, well formed, and my own specific world to bring them up in, and I'll guarantee to take any one at random and train him to become any type of specialist I might select—doctor, lawyer, artist, merchant-chief and yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations and race of his ancestors."¹

¹ J. B. Watson, *Behaviorism*, p. 104. People's Institute Publishing Company, 1930.

Actually, the nature-nurture problem is far more complex than the special pleading of the extreme hereditarians and extreme environmentalists indicates. It is very difficult to secure reliable data on the relative influence of the two factors, and to interpret the facts strictly. It is not even possible to consider an individual's characteristics in themselves as native or acquired. Instead, behavior is the result of a growth process "resultant from a constant flux or interchange of energies within an organism and energies within its environment."¹

Jennings,² a distinguished biologist, has stressed the same point in the following comment:

That which is directly inherited, in the way in which property is inherited, that which is passed bodily from parent to offspring—is the set of genes, with the accompanying cytoplasm:—certain substances in certain combinations, which, under certain conditions, give rise to the individual having certain later characteristics. With the same set of genes, different environmental conditions may induce the production of diverse characteristics. . . . There is then no thorough-going distinction in kind between diversities producible by gene differences and those producible by environmental differences. Characteristics do not fall into two mutually exclusive classes, one hereditary, the other environmental.

Type theories. The convenience of classifying persons into types has obscured the true nature of the distribution of individual differences. For example, the classification of subnormals as idiots, imbeciles, and feeble-minded has suggested sharp differentiations among the three levels, when, as a matter of fact, they are arbitrary divisions of a continuous distribution in which no sharp breaks occur. In spite of the fact that many persons cannot be so arbitrarily pigeonholed, some writers still divide the human race into introverts and extroverts. It would probably be just as defensible to divide them into short and tall. Kretschmer³ has popularized a classification of individuals into four groups based on measured

¹ M. B. McGraw, *Growth*, p. 22. Appleton-Century, 1935.

² H. S. Jennings, *Biological Basis of Human Nature*, p. 133. Norton, 1930.

³ Ernst Kretschmer, *Physique and Character*. Harcourt, Brace, 1925.

physical characteristics. The *pyknic* type has the following characteristics: medium height, rounded figure with an emphatic tendency for distribution of fat around the trunk, moderate-sized shoulders coupled with large-sized breast circumference, and broad, soft face. The *aesthenic* type is lean and narrowly built, with narrow shoulders, long arms with thin muscles, long, narrow flat chest, and thin stomach. The *athletic* individual is middle-sized to tall, has wide shoulders, deep chest, tapering trunk, and prominent musculature. The *dyplastic* type is composed of persons abnormal in physical development or extremes from the other groups.

Kretschmer has posited a relation between the physical types and personality patterns. The pyknic physique is associated with sociableness, good nature, friendliness, geniality, and practical tendencies. Jolly, cheerful moods, however, may alternate with quiet, calm, even depressed states. Aesthenic, athletic, and dyplastic individuals are said to be unsociable, serious, eccentric, timid, shy, sensitive, excitable, fond of nature and books. They may range from hypersensitiveness to indifference and dullness. They are typically "shut in" persons.

Although Kretschmer developed his types through a study of persons suffering from schizophrenic and manic-depressive psychoses, he extended the classifications to normal individuals. Carefully controlled studies of normal subjects, however, failed to substantiate the physical and temperamental relationships assumed in the theory.¹

Spranger² has divided men into the theoretic, aesthetic, social, economic, political, and religious types. He recognizes, however, that none of these types exists in its absolute form. The fact that all classifications have had to introduce a mixed type is significant. Persons cannot be categorically distributed, because differences are not abrupt but finely graded. If classification into types were valid, the measurement of a large and unselected group in the traits in question should result in a multi-modal distribution such as that represented in Figure 12 b. Suppose, however, that we should meas-

¹ Anne Anastasi, *Differential Psychology*, pp. 242-255. Macmillan, 1937.

² Eduard Spranger, *Types of Men*. Niemeyer, 1928.

ure a large unselected sample of individuals of the same age, race, and sex, with an intelligence test, a scale of some personality characteristic like introversion-extroversion, or even determine their heights. We should probably find that the measures of any one of these characteristics, when plotted, would approximate the form of a bell-shaped curve. In other words, there would be a concentration of individuals around the central tendency, or average, and a progressive and gradual diminution in number in the direction of the two extremes. The bell-shaped curve in Figure 12 a is one of the

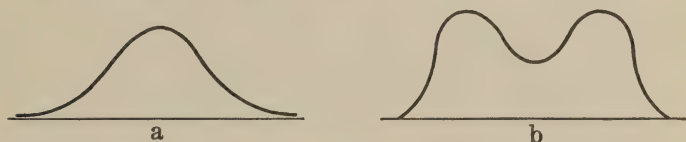


Fig. 12. (a) THEORETICAL NORMAL CURVE. (b) REPRESENTATION OF A BI-MODAL DISTRIBUTION

cases of the "normal probability curve," which is a mathematical construct. Actual distributions of human traits, of course, only approximate the theoretical curve. It describes better than any other, however, the manner in which a large number of physical and psychological traits are distributed among individuals when the samples are homogeneous with respect to other traits related to the one measured. Therefore, instead of grouping individuals into types, we should place them with respect to a continuous scale.

Differences are quantitative. Individuals thus differ quantitatively, rather than qualitatively, for the most part. Differences are of degree rather than of kind. Individuals possess most characteristics in common, but some have more of a given trait than others.

Numerous examples might be given of the distribution of physical and psychological traits. Great variation in intelligence has been recognized in the preceding chapter. Figure 13 shows the distribution of the intelligence quotients of 2904 children from ages two to eighteen on the L and M forms combined of the Stanford revision of the Binet scale. Figure 14 shows the distributions of scores at three age levels on the forms L and M combined of the Stanford-Binet scale.

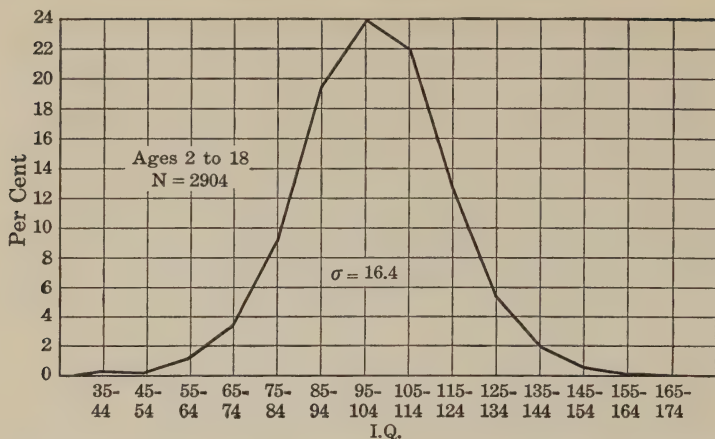


Fig. 13. DISTRIBUTIONS OF COMPOSITE L-M I.Q.'s OF 2904 CHILDREN AGES 2 TO 18 ¹

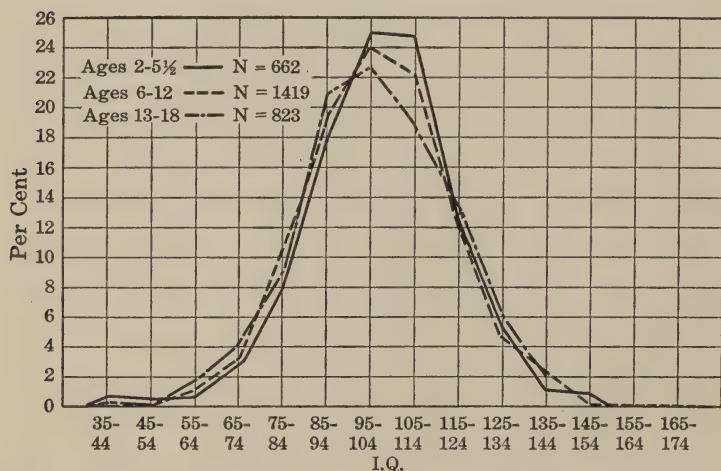


Fig. 14. DISTRIBUTIONS OF COMPOSITE L-M I.Q.'s AT THREE AGE LEVELS ²

¹From L. M. Terman and M. A. Merrill, *Measuring Intelligence*, p. 37. Houghton Mifflin, 1937.

²*Ibid.*, p. 41.

Although all these curves show some skewness—that is, departure from the theoretical probability—the approximation to the “normal” curve is nevertheless apparent in each instance.

Extent of variation. It is difficult to sense the enormity of the differences represented in graphic expressions of individual variation. Not many teachers realized, until the advent of standardized achievement and intelligence testing, the real diversity of their pupils. A recent testing program in a small school system revealed that in each of the fourth, fifth, and sixth grades there was a spread of approximately seven grades of reading ability. The best pupil in the fourth grade, for example, read as well as the typical tenth grade student, while the poorest pupil read more ineffectively than the typical third grader.

Unless the institution exercises a rigid degree of selection, approximately the same spread in reading ability will be found in college and university freshman classes. In one institution, for example, reading ability of the entering class ranged from a level below the average achievement of seventh grade pupils to that above the average ability of college sophomores.

There is not only a great variation within one grade of the ordinary school system, but the overlap between adjacent grades several years removed is striking. Commenting upon Table II (see page 210), Horn says: “Notice . . . the wide range of abilities represented in grade four. The highest mental age is as high as any in the fifth grade and is surpassed by less than four per cent of those in grade six; the lowest is as low as any in grade three. . . . The median mental age of the pupils of this grade is equal or superior to one-fourth of those in grade five and is equaled or surpassed by over one-third of those in grade three.” Consider the problems of the teacher who has a range of intelligence among the pupils in one grade as great as that which divides an average pupil of six years and an average pupil of fourteen or fifteen years.

Differences in pre-college achievement. Students who are non-plussed about differences in background from other students in their college classes, or about differences between high school and college grades, may find a part of the explanation in Figures 15

TABLE II. DISTRIBUTION OF MENTAL AGES BY GRADES¹

<i>Mental Age</i>	<i>Grade</i>						<i>Total</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	
16-6	..	..	..	..	..	5	5
16-0	..	..	..	..	..	4	4
15-6	..	..	..	..	..	3	3
15-0	..	..	..	1	1	13	15
14-6	..	..	..	..	3	19	22
14-0	..	..	..	1	4	29	34
13-6	..	..	..	2	9	28	39
13-0	..	..	..	5	23	49	77
12-6	..	1	..	19	41	49	110
12-0	..	..	4	21	58	60	143
11-6	..	2	6	47	88	56	199
11-0	..	5	19	60	106	32	222
10-6	..	15	67	69	73	23	247
10-0	4	36	116	76	47	11	290
9-6	7	83	143	88	45	4	370
9-0	22	81	101	51	24	1	280
8-6	43	98	90	53	14	2	300
8-0	87	70	33	32	3	..	225
7-6	127	67	23	22	..	..	239
7-0	127	28	5	7	..	..	167
6-6	132	7	1	2	..	..	142
6-0	86	3	2	1	..	..	92
5-6	71	1	..	..	..	..	72
5-0	22	..	..	..	..	..	22
4-6	8	..	..	..	..	..	8
4-0	8	..	..	..	..	..	8
<i>Total</i>	744	497	610	557	539	388	3335

and 16. Figure 15 shows the distributions of scores on an objective achievement test in ninth grade algebra in two large schools. Notice that the area of overlap between the two distributions is very small—certainly an A in one school must mean something very different from an A in the other.

¹ Ernest Horn, *Methods of Instruction in the Social Studies*, p. 44. Scribner, 1937.

Figure 16 shows the distributions of scores on an objective achievement test in ninth grade algebra for pupils who received various letter grades at the completion of the course. The shaded area shows the overlap (in terms of scores) between grades of F and A, B, and C. Students who received A's in algebra made scores on this test ranging from about 10 to 49. Students who received F's made

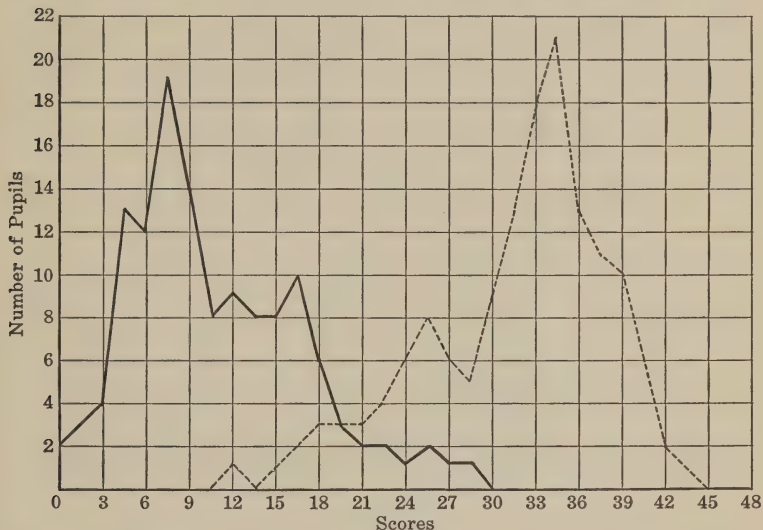


Fig. 15. DISTRIBUTIONS OF SCORES ON THE 1933 IOWA EVERY-PUPIL TEST IN NINTH GRADE ALGEBRA IN TWO SCHOOLS

Courtesy of E. F. Lindquist

scores ranging from 0 to 34. There is a considerable overlap between the A and F distributions. The differences among high school students in achievement are due to many factors, of which intelligence and quality of teaching are undoubtedly of considerable importance. But no matter what the causes, college classes are anything but homogeneous groups as far as academic background is concerned.

It is this tremendous variation in intelligence, special aptitudes, and achievement, as well as differences in temperament and interests, which makes it so essential for the individual to plan his

educational and vocational career with full knowledge of his characteristics, actual and potential.

Variation within the individual. Individual analysis involves not only the discovery of one's relative position in a group on one

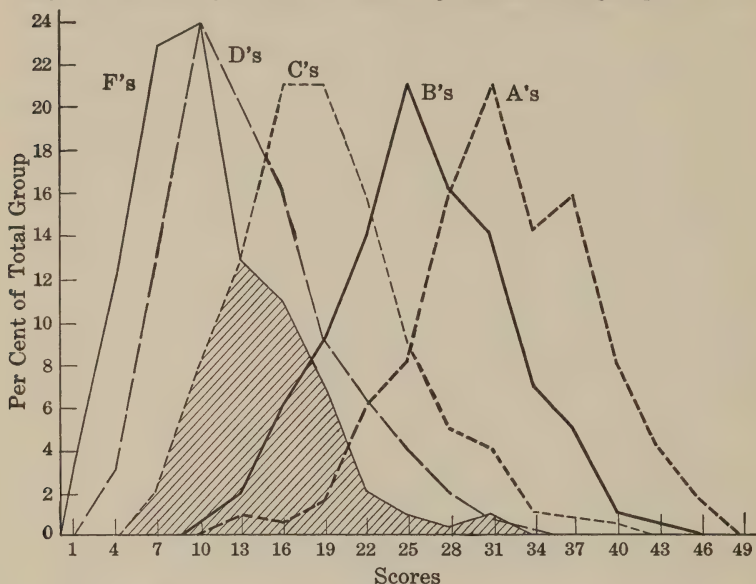


Fig. 16. DISTRIBUTIONS OF SCORES ON THE 1932 IOWA EVERY-PUPIL TEST IN NINTH GRADE ALGEBRA FOR PUPILS WHO RECEIVED VARIOUS LETTER GRADES

Based on scores and grades of 2724 pupils in 54 high schools. Courtesy of E. F. Lindquist

trait, such as verbal intelligence, but an examination of his variability from one trait to another. It is true that psychologists have had to explode the fallacy of compensation—that is, the belief that for every trait in which the individual is inferior to the average of a given population, he possesses one correspondingly above the mean. The evidence reveals, rather, that there is a positive relationship among the traits of the individual. This means that there is a tendency for the capacities of a person to group themselves closely around a mean or norm for that person. In other words, we may

expect that an individual's capacities will conform generally to a given level. If he is above the average of the population on one trait, he will more likely than not be above average in other traits as well. This correlation or correspondence of traits, however, is by no means perfect. Most traits will hover about the individual mean, as individuals tend to cluster around the average of a group. Nevertheless, in certain abilities, the individual may deviate substantially from his central tendency in one direction or the other. It has been estimated, in fact, that an individual's best aptitudes may be almost three times as good as his worst. It has already been noted that the correlation of abilities is highest within related groups, and that the correspondence decreases as one goes from one group to another—say, from verbal aptitudes to mechanical aptitudes or to artistic aptitudes. In fact, the relationships between graphic or musical aptitudes and verbal intelligence may approach zero. The former capacities seem to vary almost independently of verbal aptitude. Note, however, that the correlations would have to be substantially negative to express the inverse association required by a theory of compensation. The possibility of significant variation around the average of an individual's abilities, however, is sufficient to justify the student and his counselor in searching for his greatest potentialities, and building a training and vocational program around them. This problem is discussed more fully in Chapter XI.

HEREDITARY AND ENVIRONMENTAL INFLUENCES

The relative influence of heredity and environment in human variation remains an intensely interesting problem for both scientist and layman. It is clear that differences among individuals are due both to nature and nurture, but it is extremely difficult to determine quantitatively the relative contribution of the two factors to individual development or to the differences among individuals. The inherent complexity of the problem is due, of course, in great part to the fact that we deal actually not with a nature-nurture dichotomy but with a continuous growth process in which organism and environment can be separated out only arbitrarily and artifi-

cially, for both are intimately related as members of a dynamic whole.

Twin studies. A biologist, a statistician, and a psychologist¹ pooled their technical abilities in a study of the relative influence of nature and nurture on individual differences. They studied the resemblances of fifty pairs of identical twins and of fifty pairs of fraternal twins reared together. The first type are assumed to be identical in heredity, and the second to share the same heredity to the extent of about 50 per cent on the average. Comparisons were made on the bases of the following measures: the Stanford-Binet and three group intelligence tests, the Stanford Achievement Test, the Woodworth-Mathews Personal Data Sheet, the Kent-Rosanoff Free Association Test, the Pressey Test of the Emotions, and the Downey Will-Temperament Test. It is unfortunate that more valid and reliable measures of personality factors were not used.

Identical and fraternal twins compared. The identical twins were much more alike than the fraternal twins in physical dimensions, test intelligence, and educational achievement. In personality factors, however, the two types were not greatly different. Some of the correlations obtained follow:

	<i>Identical</i>	<i>Fraternal</i>
Average for		
9 physical traits.....	.91	.53
4 measures of intelligence.....	.89	.61
6 sections of the Stanford Achievement Test...	.82	.67
Woodworth-Mathews scores.....	.56	.37
Downey Will-Temperament scores.....	.44	.52
3 tapping speed tests.....	.65	.40

The greatest differences in extent of resemblance between the two types of twins were in physical traits, then in mental test scores, then in the achievement tests, and least in the measures of temperament and emotionality. As they grew older, the identical twins

¹ H. H. Newman, F. N. Freeman, and K. J. Holzinger, *Twins: A Study of Heredity and Environment*. University of Chicago Press, 1937.

remained about as much alike in both physical and mental traits. However, although the fraternal twins remained as much alike in physical traits, their resemblance in mental characteristics decreased with age. The authors believe that the fraternal twins pursued different paths as they grew older, and that the environmental differences demonstrably affected their characteristics.

The extent to which hereditary factors accounted for individual differences among the two types of twins varied for physical traits, test intelligence, school achievement, and temperament and emotionality. Complicated statistical analyses revealed that from 75 to 90 per cent of the variation in physical traits was attributable to nature. Heredity accounted for from 65 to 80 per cent of the differences in intelligence, 64 per cent of the variance in Stanford Achievement scores, 30 per cent in the Woodworth-Mathews scores, and from 27 to 50 per cent in the tapping tests. The authors were unable to separate the effect of pre-natal and post-natal environments. It seemed likely, however, that pre-natal conditions were very significant, even in the case of identical twins, which are subject to differences in blood supply due to unequal blood exchange between the two fetuses, and to the asymmetry mechanism.

Differences among separated identical twins. The same scientists studied the resemblances and differences of nineteen pairs of identical twins reared apart. Like the data for identical and fraternal twins reared together, the information concerning separated identical twins revealed that environment had more influence on some traits than others. In weight, intelligence, and school achievement, the differences were greater among separated pairs than among those who lived together. In height, head measures, and Woodworth-Mathews score, however, there were no significant differences between the two groups. In weight, intelligence, and school achievement, separated identical twins were about as different as fraternal twins reared together. For these traits, the authors conclude that "if we average together the various amounts of environmental differences found in the separated identical twins,

they just about balance in their effect the amount of hereditary difference which exists between fraternal twins.”¹

Some of the correlations for three groups of twins follow:

<i>Measure</i>	<i>Separated</i>		
	<i>Identical</i>	<i>Fraternal</i>	<i>Identical</i>
Standing height.....	.981	.934	.969
Weight.....	.973	.900	.886
Binet I.Q.....	.910	.640	.670
Stanford Achievement.....	.955	.883	.507
Woodworth-Mathews.....	.562	.371	.583

A majority of the separated pairs were reared in very similar environments. The differences between the members of these pairs were no greater than those found among unseparated pairs. Most of the differences in the separated identical group were among six pairs. Such facts as these led to the conclusion that there was a high relationship between the extent of environmental differences and the amount of difference between the separated twins. The conclusion was that “if the environment differs greatly as compared with heredity the share of environment in determining traits which are susceptible to environmental influence is large.” Conversely, “If . . . there is large genetic difference and small environmental difference, the share of heredity is relatively large.”²

The differences in Stanford-Binet I.Q. between separated pairs ranged from 1 to 24, with an average of 8.21. There were marked differences in personality traits in four pairs, and very little difference in five. Ten pairs showed differences in certain tendencies, and similarities in others.

Foster children. Another way to attack the nature-nurture problem is to compare the correlations between the intelligence of siblings reared apart and those reared together. One such study³

¹ *Ibid.*, p. 357.

² *Ibid.*, p. 359.

³ F. N. Freeman, K. J. Holzinger, and B. C. Mitchell, “The Influence of Environment on the Intelligence, School Achievement and Conduct of Foster Children,” National Society for the Study of Education, 27th Yearbook, 1928, Part I, chap. IX, pp. 103-217.

gives a coefficient of .25 for a group of siblings separated before the age of six. The resemblance was greater in the case of those who had been separated the shorter length of time. The correlation for siblings reared together is ordinarily about .50. When just those cases were considered whose foster homes were of decidedly different grade, the relationship was only .19.

The correlation between forty pairs, each composed of a foster child and an own child living in the same home, was .34. The relationship between seventy-two pairs, each composed of unrelated foster children in the same home, was .37. This similarity of unrelated children was thought to be due to the effects of similar environment for each of the pairs, for apart from such influences, one would expect the correlation to be zero.

The correlation between the intelligence of children and foster parents was .37. The author believed that this resemblance could not be accounted for by selective placement—that is, the tendency for superior foster parents to adopt children of superior intelligence. An initial correlation of .34 between intelligence of foster children and home rating increased to .52 after a period of residence in the new home. A comparison of gains in intelligence quotients during foster home residence was made for those who were placed in better and those adopted into poorer homes. The former gained, on the average, about five I.Q. points, and the latter made no appreciable gain.

The report concludes that home environment has an appreciable effect on intelligence, but it does not attempt to estimate its relative potency. Another psychologist,¹ after studying the effect of foster homes upon children placed before the age of twelve months, and examined at ages from five to fourteen, concluded that home environment accounted only for about 17 per cent of the individual differences in I.Q., that the maximal contribution of the best home environment to intelligence almost surely lies between ten and thirty points, and that nearly 70 per cent of school children have an

¹ Barbara Burks, "The Relative Influence of Nature and Nurture upon Mental Development," National Society for the Study of Education, 27th Yearbook, Part I, chap. X, pp. 219-316.

actual I.Q. within six to nine points of that represented by their "innate" intelligence.

Environment was still less impressive as a factor responsible for variation in intelligence among a group of 194 foster children who were the subjects of a recent investigation.¹ The adopted children were paired with an equal number of own children on the following bases: race, age, sex, adopted and true father's occupational level and amount of formal education, and the size of community in which they lived. The environments of the two groups were approximately identical. The foster children had been adopted at the age of six months or younger. They were from five to fourteen years old (average, 9.3 years) when the study was made.

The correlation between the children's intelligence scores and parental intelligence, amount of parents' education, and home environmental factors hovered around .20 for adopted subjects and .50 for own children. The I.Q.'s of the own children progressed consistently with increases in the occupational level of the parents, but those of the adopted group showed no such relationship. The seven adopted children in the most stimulating environment had a mean I.Q. of 113.3. The eight control subjects living in a comparable environment had a mean I.Q. of 127.5. The eleven adopted children in the least stimulating environments had a mean I.Q. of 106.0, while the sixteen own children in similarly poor environments had an average I.Q. of 99.5. There was a negligible relationship between the I. Q.'s of own and adopted children living together, and also between unrelated adopted children in the same home. Statistical analysis revealed that only about four per cent of the variation in intelligence among the adopted children could be attributed to differences in the environment. The investigator concluded, however, that since there was little relationship in either group between emotionality and home environment, "heredity plays a less significant rôle than environment in the variation observed for other traits than intelligence."

The following relationships were discovered:

¹ A. M. Leahy, "Nature-Nurture and Intelligence," *Genetic Psychology Monographs*, vol. 17 (1935), pp. 236-308.

	<i>Foster Children</i>	<i>Control Children</i>
Correlation of child's I.Q. with		
Father's intelligence score.....	.19	.51
Mother's intelligence score.....	.24	.51
Cultural index of home.....	.26	.51

Relative contributions to differences. A further attempt to quantify statistically the data of one of the nature-nurture studies¹ resulted in a graphical expression of the relative contributions of

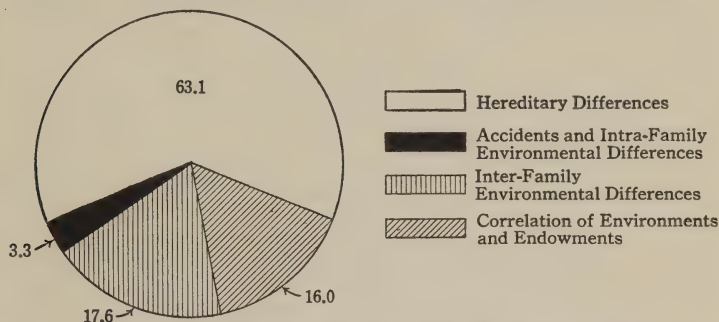


Fig. 17. RELATIVE CONTRIBUTIONS OF HEREDITY AND ENVIRONMENT TO INDIVIDUAL DIFFERENCES IN INTELLIGENCE

heredity and environment to individual differences in intelligence. The diagram is reproduced here.² Hereditary differences are represented as contributing 63.1 per cent of the variation. The other weights are: accidents and intra-family environmental differences, 3.3 per cent; inter-family environmental differences, 17.6 per cent; correlation between environments and endowments, 16 per cent. (There is a tendency for nature and nurture to work together to increase or to decrease intellectual level.)

One may conclude that "*environmental differences* are relatively small in comparison with hereditary differences in determining *individual differences* in intelligence."³ This generalization does

¹ Burks's study, referred to on page 217.

² F. K. Shuttleworth, "The Nature vs. Nurture Problem," *Journal of Educational Psychology*, vol. 26 (December, 1935), pp. 655-681.

³ *Ibid.*

not preclude the possibility that changes in the *general level* of the *environment* may affect the *general level* of *intelligence*. The writer just quoted points out that it is probable that the great increase in quality of physical and mental care, schooling, and intellectual stimulation of children in the last century has resulted in a higher average I.Q. in the population. He believes that the increase in the average quality of the environment has been mainly a leveling up process; in other words, that most improvement has taken place in the less rather than the more fortunate environments. The fact that there may have been an increase in the average intelligence of the population, however, does not mean that environmental differences are more responsible for *differences* in intelligence within the present population than in that of a century ago. As a matter of fact, if, through the leveling up process, there is less variation in the quality of the environment, and the average level and variation in endowment remain approximately the same, differences in heredity become even more influential in accounting for differences in intelligence among persons in the population.

It is worth recalling again that what the individual inherits is not traits as such, but genes. The characteristics of the individual result from a developmental process in which the genes and the environment interact in complex fashion. Intelligence does not develop independently of the environment. The quantity and quality of stimuli to growth should affect the extent to which genetically possible limits are reached. Such studies as that by Wellman suggest that growth of intelligence may be facilitated by certain environments. There is also some evidence that a poor environment can retard mental growth.

Environment may inhibit growth. The stultifying effect of environment upon intellectual growth is illustrated by an interesting study of canal boat and gypsy children.¹ These children, many of whom had illiterate parents, had little schooling and meager social experience. Their average intelligence quotient was approximately 70. But the striking fact was that there was a progressive decrease

¹ Hugh Gordon, *Mental and Scholastic Tests among Retarded Children*. London: Board of Education, Education Pamphlet No. 44, 1923.

in the intelligence quotients from younger to older children. The average I.Q. of those four to six years of age was 90, and of those 12 to 22 years old, 60. The study of gypsy children showed the same general trend. It is possible that the Binet scale, because of its highly verbal nature, is not a valid measuring instrument for these children, but the steady decrease remains an arresting fact.

The available evidence indicates that it is possible to affect the growth of intelligence by changing the environment, provided the change be great, that it take place at an early age, and that it persist over an extended period.

RACE AND NATIONALITY

The American Negro. Almost all comparisons of the average intelligence test scores of Negro and white children even in Northern cities have revealed the relative manifest inferiority of the Negro. Striking exceptions to the general trend are studies of the relative intelligence of 500 Negro elementary school children in five Los Angeles schools, who proved to be slightly superior to the white children with whom they were compared, and of groups of twelve-year-old white and Negro boys in New York which proved to be equal in ability. Such results as the latter have ordinarily been explained as the result of selective migration, for Northern Negroes are known to test higher in intelligence than Southern Negroes. A careful investigation revealed, however, that Negro children who migrated to the North from Birmingham, Nashville, and Charleston were not superior to those who remained. There was also a close, though not a perfect, relationship between mental test score and length of New York residence of migrants from the South:¹

<i>Group</i>	<i>Number of Cases</i>	<i>Average I.Q.</i>
Less than one year	42	81.4
One to two years	40	84.2
Two to three years	40	84.5
Three to four years	46	88.5
More than four years	47	87.4
New York born	99	87.3

¹ Otto Klineberg, *Race Differences*, p. 186. Harper, 1935.

These facts and those of other similar studies seem to argue for a substantial effect of environment upon the mental test scores of Negroes; they indicate further that the influence seems to take place most markedly in the first five or six years.

The author of the study concluded that "as the environment of the negro approximates more and more closely that of the white, the inferiority tends to disappear. . . . When comparisons are made within the same race or group, it can be demonstrated that there are very marked differences depending upon variations in background. These differences may be satisfactorily explained, therefore, without recourse to the hypothesis of innate racial differences in mental ability."¹

National and racial groups. Most measurements of national foreign groups in this country, of which the Army test results gave much of the early data, have revealed substantial differences among them. Immigrants from northern European countries have shown superiority over those from southern Europe. In general, studies have resulted in the following rank order: British Isles, Holland, Germany, Scandinavian countries, Greece, Russia, Italy, and Poland.² It cannot be assumed, however, that these immigrant groups are representative of the European national groups from which they come. Furthermore, the data for national and racial subgroups are quite different. For example, while groups of American-born children of parents native to fifteen foreign countries, living in similar communities and receiving approximately the same schooling, showed significant differences in intelligence when divided by national groups, when classified by racial groups—Nordic, Alpine, and Mediterranean—there was a relatively small difference among the three racial subgroups within a single nationality. However, when different nationalities within a single racial group were compared, much greater disparities occurred.

To explore these relationships further, an investigator³ compared natio-racial groups of boys ten to twelve years of age in three European countries as follows: a German Nordic group in the Province

¹ *Ibid.*, p. 189.

² *Ibid.*, p. 189.

³ *Ibid.*, pp. 192-194.

of Hanover; a French Nordic in French Flanders; a German Alpine in Baden; a French Alpine in the Massif Central; an Italian Alpine in Piedmont; a French Mediterranean in the eastern Pyrenees; and an Italian Mediterranean in Sicily. The individuals were tested with the Pintner-Paterson Point Scale, a performance scale designed to obviate language handicaps in intelligence testing. He found the average differences among the racial groups small and unreliable. But when national groups within one racial group were compared, differences were appreciable. These data seem to suggest that national environments and cultural influences, rather than basic racial membership, are mainly responsible for the differences which appear among natio-racial groups. The findings at least cast doubt upon the assumption that manifest superiority of North European peoples can be ascribed to genetic racial differences or to a supposed "racial purity." The results must be accepted with caution, however, since there is some doubt that the test used adequately reveals individual differences at the ages tested.

Testing of racial groups depends upon factors of test motivation, rapport, cultural, social, and economic status, language variations, educational opportunity, sampling, and general environmental situations. One must therefore interpret the results of studies of racial differences cautiously, and with consciousness of the many variables which may affect the findings.

The North American Indian. Garth¹ found that the average I.Q. of 2650 full-blood Indians as measured by the National and Otis intelligence tests (examinations stressing verbal and mathematical abilities) was about 69. (The average I.Q. of white children is 100.) The average I.Q. of children of mixed Indian and white blood is slightly higher and tends to increase somewhat with the proportion of white blood, a fact which may be as well due to progressive superiority of environment, as the amount of white blood increases, as to greater genetic influence of the supposedly superior race. In fact, Garth believes that educational factors are most influential in

¹ T. R. Garth, *Race Psychology*, p. 76. McGraw-Hill, 1931.

increasing the average I.Q. of mixed bloods. Recently, a group of Indian children tested with the Pintner-Paterson Performance Scale and the Pintner Non-language Test gave average I.Q.'s of 96 and 97, respectively, a result not far inferior to the general white population.¹ Garth believes that the differences so far found may be ascribed chiefly to the effects of selection in the samples tested; to the inferiority of the cultural, social, economic, and educational environments of the Indian children; and to the nature of their racial ideals.²

Although environmental interpretation of the inferiority of both Negro and Indian groups is strengthened by the fact that they differ much less from the white population on performance in non-language tests than in verbal intelligence tests, this fact is itself difficult to interpret. It is by no means certain that language and non-language tests measure the same underlying intellectual capacities.

Determining the influence of race upon temperamental differences is even more difficult than for intellectual differences, for the environment is extremely potent in its effect upon emotional dispositions and attitudes. The few studies made to date, however, do not substantiate the popular belief in characteristic racial temperaments such as the relative emotional stability of the Nordic and the excitability of the South European.

Intra-racial differences most significant. All investigators agree that variation within one race is far more significant than the differences among the races. Problems of education and adjustment are individual, not racial. It is more fruitful, therefore, in human engineering and personal evaluation, to consider the individual—his capacities and aptitudes, his possibilities and limitations, and the effect of his present and previous educational, cultural, social, and economic surroundings. Promising—even exceptional—individuals may be found in all racial groups, and there is abundant

¹ *Idem*, "The Intelligence and Achievement of Mixed-blood Indians," *Journal of Social Psychology*, vol. 4 (1933), pp. 134-137.

² *Idem*, "The Hypothesis of Racial Difference," *Journal of Social Philosophy*, vol. 2 (1937), pp. 224-231.

evidence to show that the cultural status of all groups may be substantially increased by extending and enriching their educational opportunities.

SEX DIFFERENCES

Intelligence and achievement. The results of mental tests give no comfort to those who still assert that men are more intelligent than women. No significant differences in average score are found when intelligence tests are administered to large samplings of the male and female populations. There may be appreciable differences in score on certain items of the tests, but such variations tend to cancel out in the composite result. Thus, girls seem to be somewhat superior to boys in tests of logical memory and linguistic ability. Girls excel boys in achievement in language, English, art, spelling, and handwriting. Boys score higher than girls on most tests of speed and precision of movement, in mechanical aptitude, and in arithmetic reasoning and general information. They surpass girls in achievement in physics, chemistry, general science, history, and possibly, at later ages, in mathematics, particularly geometry. Girls are slightly superior to boys on the Stanford-Binet Test and most of the group tests up to age fourteen. At high school ages, however, boys in general test somewhat higher than girls; this is due at least in part, no doubt, to selective factors. Nevertheless, girls make higher grades through the high school and college period.

There is evidence to the effect, also, that the sexes are on the average substantially equal with respect to such special aptitudes as music and art.

Relative variability. Although average performance of the two sexes on mental tests is approximately the same, it is possible that the males are slightly more variable than the females. If this is true, the extremes of the distribution should be farther from the mean in the case of the males. This would produce an excess of males in both the extremely gifted and the extremely deficient groups. While the weight of evidence seems to substantiate such a conclusion, not all studies agree. The fact that the proportion of

women who achieve eminence is less than that of men is not decisive evidence of greater male variability, for women have enjoyed relatively limited opportunities for leadership. The fact that there are more boys than girls in institutions for the feeble-minded is also not conclusive proof of greater variability, for it is possible that feeble-minded girls are more often cared for without institutionalizing them. On the other hand, Terman found 116 boys to every 100 girls in locating cases for his study of a thousand gifted

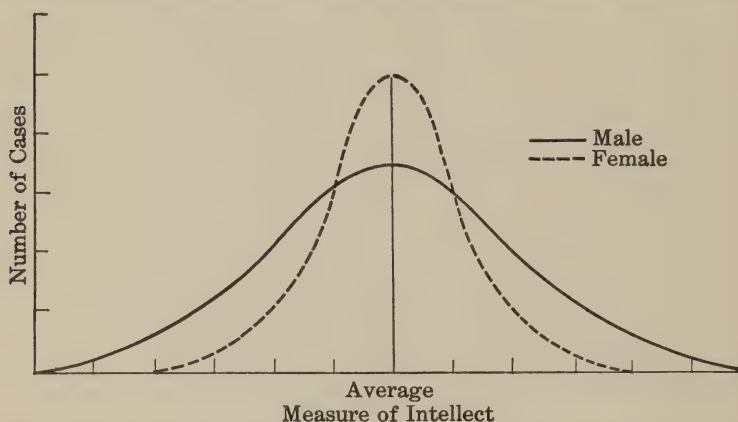


Fig. 18. HYPOTHETICAL DISTRIBUTION OF INTELLECT AMONG MEN AND WOMEN ACCORDING TO THE DOCTRINE OF GREATER MALE VARIABILITY ¹

school children. This is much higher than the excess of male births in the general population, which is about 106 to 100. A recent writer, after examining the studies, however, concluded that the findings on relative variability differ with the specific situation, and that the differences found are too slight to be of significance.²

Interests. There are real sex differences in such characteristics as reading and play interests. To what extent these differences are due to environmental and to hereditary differentials one cannot say, except that it is likely that training and experience are large factors. It has been suggested that "the presence of a true though small

¹ Anne Anastasi, *Differential Psychology*, p. 394. Macmillan, 1937.

² *Ibid.*, p. 391.

group difference at an early age may operate as an influencing or directive factor contributing or giving rise to interests, preferences, habits, and educational and vocational emphasis. Thus originally small, manifested differences may be enlarged into permanent and significant ones, such as those found between adult members of the sexes.”¹

It is more difficult to secure reliable and valid information concerning the personality differences between the sexes. It is desirable, at present, to consider the evidence as suggestive only.² A study of the content of conversations showed that women talked most frequently of men and clothes; and men, of business and money. In a study of values, women’s preferences fell in the aesthetic, social, and religious groups, and men’s in the theoretical, economic, and political. College women scored higher than college men on a test of the “best thing to do” in social situations, and on common facts of human behavior which might be observed in social contacts.

Character. In a survey of elementary school children, the girls were superior to boys in moral knowledge and social attitudes, both from a conventional and “ideal” point of view. In tests devised to reveal cheating, lying, and stealing, no consistent sex difference was discovered. Other tests showed girls better able to inhibit impulses—that is, show more self-control—than boys. On tests of “service” the girls’ scores showed them somewhat more coöperative than boys, but not reliably so. In reputation for service and persistence, girls were definitely superior to boys.

Neurotic tendencies. About 20 per cent more neurotic symptoms were found among college women than among college men by the administration of the Colgate Mental Hygiene Tests. The results of tests of the two sexes on introversion traits are somewhat conflicting. Although one study revealed little difference, another employing the Bernreuter Personality Inventory showed women to be more introverted. The latter study also showed that women

¹ F. S. Freeman, “Individual Differences,” in C. E. Skinner (Editor), *Educational Psychology*, p. 423. Prentice-Hall, 1936.

² The following summary is taken from the studies reported by Anne Anastasi, *op. cit.*, pp. 434-443.

were higher on neurotic tendency, while men were higher in self-sufficiency, dominance, and self-confidence. These results, however, should be taken tentatively, for evidence of the validity of the measuring scale is not entirely reassuring.

Among a group of more than 1000 boys and girls between the ages of nine and nineteen, the median number of neurotic symptoms reported for boys was 20, and for girls, 25.5. At age ten, the number reported for boys was greater than for girls, at eleven there was no significant difference, and after this age the girls showed a decrease and the boys an increase in emotional stability.

Sex and personality. Recognizing that the "belief still remains that the sexes differ fundamentally in their instinctive and emotional equipment and in the sentiments, interests, attitudes and modes of behavior which are the derivatives of such equipment," Terman and Miles ¹ set out to study certain relationships of sex and personality. They were particularly interested in the individual variants from the mean characteristics of either sex. They first identified series of reactions in which, whether by force of nature or nurture, male and female groups ranging in age from early adolescence to old age actually differ. They prepared, on the basis of these differences, a masculinity-femininity test, for the purpose of obtaining an objective rating of personality traits in which the sexes differ, and of making possible a quantitative statement of a subject's deviation from the mean of his or her sex. There are two equivalent forms of the test, of 456 and 404 items respectively, which is constructed in multiple choice fashion. Each response is scored masculine or feminine. The following types of items appear in the test: ink blot association, information, emotional and aesthetic attitudes, interests, opinions, and introvertive response. The following are among the more interesting results of administering the test to a large number of persons of different sex, age, intelligence, education, interests, occupation, and cultural milieu:

1. When measured by the Laird and Conklin tests, "the more masculine college men tend to be extroverted, and the more feminine

¹ L. M. Terman and C. C. Miles, *Sex and Personality*. McGraw-Hill, 1936.

college men to be introverted." Among college women, there is a "slight tendency for introversion to be associated with femininity, extroversion with masculinity. . . ." (p. 103)

2. Among males, there is a positive correlation between M-F scores and mechanical ability.

3. "High scholarship men are more feminine, low scholarship men more masculine. . . . The interests of high scholarship men are more cultural, those of low scholarship men more mechanical and athletic." (p. 121)

4. "The M-F scores of athletes tend to be strongly masculine. This is true of both sexes, but is especially marked in the case of women." (p. 121)

5. There is an increase in masculinity for boys throughout the grammar grades and high school, and for girls into the college years. After these periods, both sexes become more feminine, and the males change more than the females. The authors found that "mental M-F scores are correlated with education to an appreciable extent. In the male population, the order from greatest to least masculinity shows first the college group, then the high school group, and last the grade school group. . . . In the female population, education makes noteworthy differences at all ages for which norms have been derived, especially between the more feminine groups of grade school and high school women on the one hand and the more masculine college women on the other." (pp. 146, 147)

6. Among the male vocational groups, the following are most masculine: engineers, architects, lawyers, salesmen, bankers, executives, teachers, physicians, surgeons, and dentists. The following fall into an intermediate position: mechanical, clerical, and mercantile personnel, members of the building trades, farmers, and policemen and firemen. The least masculine are editors, journalists, clergymen, and artists.

The authors conclude that mechanical occupation is strongly masculine in influence; that social and humane activities have a feminine influence; and that cultural and philanthropic pursuits, "concerns of the spirit," have a profound feminizing effect.

7. The women's vocations, ranked from least to most feminine,

were as follows: (1) professional, (2) business, (3) housewifely, (4) artistic, and (5) gainful domestic.

The interests of men and women were summarized as follows:

. . . the males included in the standardization groups evinced a distinctive interest in exploit and adventure, in outdoor and physically strenuous occupations, in machinery and tools, in science, physical phenomena, and inventions; and, from rather occasional evidence, in business and commerce. On the other hand, the females of our groups have evinced a distinctive interest in domestic affairs and in aesthetic objects and occupations; they have distinctively preferred more sedentary and indoor occupations, and occupations more directly ministrative, particularly to the young, the helpless, the distressed. Supporting and supplementing these are the more subjective differences—those in emotional disposition and direction. The males directly or indirectly manifest the greater self-assertion and aggressiveness; they express more hardihood and fearlessness and more roughness of manners, language and sentiments. The females express themselves as more compassionate and sympathetic, more timid, more fastidious and aesthetically sensitive, more emotional in general (or at least more expressive of the four emotions considered), severer moralists, yet admit in themselves more weaknesses in emotional control and (less noticeably) in physique.¹

Although Terman and Miles do not overlook the fact that variation between the sexes may be due to basic physiological differences including endocrine equipment and functioning, they nevertheless consider that environmental factors are to a great extent responsible. "In so many ways too familiar to realize, each sex gives and receives such different treatment as largely to explain the divergences in expression or in fact revealed by the material we have studied."²

EFFECT OF PRACTICE

Perhaps the tendency in a democratic society to stress the leveling effect of education and other social institutions is in part responsible for the perennial interest in the effect of training on

¹ *Ibid.*, pp. 447-478.

² *Ibid.*, p. 449.

individual differences. Do equal amounts of education reduce, increase, or hold constant the differences among individuals? The experimental results are as yet conflicting. The problem is complicated by such difficulties as determining the amount of previous practice, the zero-point of skill or ability, the effect of underlying growth, what constitutes equivalent training, how to measure the product, and how variability is expressed.

Suppose that the subjects practice for equal periods of time, and that their scores are expressed in the amount accomplished per time unit. Under these conditions, the absolute differences among the individuals tend to increase. For example, the range of scores approximately marking off the middle two-thirds of the distribution is greater than before. However, individuals tend to retain the same relative standing in the group as practice continues. Those who are high at the beginning tend to remain at the top; those low at the beginning are found in the same relative position in the end.¹ The effect of training probably varies somewhat with the complexity of the function learned. There is some reason to expect that absolute differences may decrease under practice in simple responses, but increase in the case of complex functions. All studies show that there is a possibility of considerable improvement in all subjects.

For purposes of social adjustment, it seems desirable to bring as many persons as possible to a minimum level of achievement in certain basic skills, abilities, knowledges, and attitudes. It is likely, however, that individual variation may contribute greatly to social progress. If this is true, we should encourage persons to be different instead of forcing them into conventional patterns of thinking and action. There are powerful student mores in college as well as in the larger society which penalize fruitful individual variation. The result is often a stifling and reactionary equivalence of beliefs, attitudes, standards, and appreciations. Those who differ are branded as "radical" or "peculiar" and usually suffer social ostracism. But persons who rest complacently in their smug traditionalisms, prejudices, and judgments do not realize what stimulation they may miss by not becoming interested in persons who explore, who

¹ Anne Anastasi, *op. cit.*, pp. 156-157. Macmillan, 1937.

question, who dissent, who diverge. It has been said that educational institutions should take individuals who are different at entrance and make them more different still by graduation. It would be fruitful for students and teachers to ponder the implications of that statement.

QUESTIONS

1. What are some of the types into which individuals are popularly classified? How valid are these classifications?
2. Would the intelligence test scores of any fairly large group of individuals be distributed in the form of a bell-shaped curve?
3. Would it be justifiable to use the "normal curve" as a basis for grading at all levels of education?
4. If mental test scores, reading scores, or other measures are available for the entering class in your institution, secure the results and plot them in the form of a frequency polygon.
5. Explain that wide variation of abilities in the same individual would not necessitate a theory of compensation.
6. Is it possible that relatively small environmental differences might have little effect on intellectual differences, while great environmental differences might have a substantial influence? Would you expect any relationship between the age at which foster children were adopted and the effect of the foster home on intelligence? Any relationship between the duration of foster residence and effect on intelligence?
7. Would it be possible to increase the average level of mechanical aptitude in a given group of subjects by special training without changing the relative rank of the individuals greatly? Show that the problem of environmental influences on level of ability is not identical with that of the relative influence of heredity and environment on individual differences.
8. Criticize this statement: Since studies show that heredity accounts for such a large portion of variance in intelligence among individuals, each person will almost certainly reach a given point of intellectual aptitude irrespective of his home and educational advantages.
9. What is the influence of age on individual differences? Would you expect chronological age to be a safe guide to all aspects of development?

10. Why are *national* and *racial* groups not synonymous?
11. In what ways may cultural factors influence an individual's measured intelligence?
12. Can it safely be assumed that sex differences reported in the text are relatively unrelated to environmental factors?
13. What are the advantages of human variation? What proposals have been made to increase the effective capacity of the race? How promising do the various suggestions seem to be?

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III. ADJUSTMENT TO COLLEGE AND LIFE

CHAPTER X

SOCIAL BEHAVIOR AND ADJUSTMENT

SOCIETY AND THE INDIVIDUAL

Why do we study, as such, social behavior and adjustment? Is not society merely a collection or aggregation of individuals? Does not individual psychology, as it is sometimes called, explain, through its analysis of the individual organism, the action of groups of individuals? Or do groups, not only of people but of animals as well, possess psychological characters of their own—and perhaps unique psychic attributes? Is there, perhaps, an “overmind” or group mentality which sways individuals, often to a malign purpose, and which transcends the common laws governing social units?

In this discussion, “group behavior” implies the concerted conduct of two or more persons reacting toward a common goal or because of a common motivation. Allport ¹ distinguishes the “group” from the “crowd,” which is a more primitive aggregation, but says that a group may easily become a crowd.

Sheer common sense inclines one to doubt the thesis that society is a mere collection of individuals. Groups, for example, under certain kinds of provocation act in ways which are different from what individual action would be with identical stimulation. Of course, the mechanics of the situation are of some moment; groups, because of their size and organization, can do what the single person cannot. They can storm jails, raise heavy logs at Valley Forge, or push stalled cars. But the essential point to be considered is whether, in doing these many things denied to unit potentiality, they act according to other than cumulative individual effort.

Individual psychology attempts to explain all human conduct according to the theory that *all* behavior is to be explained as a

¹ F. H. Allport, *Social Psychology*, p. 260. Houghton Mifflin, 1924.

synthesis of mechanical, physiological, and physical forces. But this explanation is false, say others, who hold that both crowds or mobs and groups react in ways which are unique not only in amount (as contrasted to the individual) but also in the kind or quality of the response. Allport ¹ distinguishes between crowds and groups in this *quality* of response, and maintains that the group is on a higher level judged by a social criterion.

What are some of these qualitative attributes of group action? They seem to include:

(1) *Reciprocal reënforcement*. Group action gets one of its distinguishing qualities from the effect which people doing the same thing have on each other. Allport ² makes much of this point. Such reënforcement may be explained either as the result of the cues offered by several persons to each other or, more metaphysically, as the consequent of some psychic metamorphosis which occurs through group stimulation.

(2) *Emotional unity*. Reciprocal reënforcement in group action shows itself nowhere more clearly than in the field of emotions. In a low level group, such as a lynching mob, the emotional effect of the members upon each other is very obvious. True, this phenomenon is not without its analogy in individual conduct; a temperamental person often works himself into a rage through the circular reënforcement which his own responses offer. But in group conduct this augmenting is especially noticeable. Its result is an emotional unity which drives the group powerfully toward the common objective. In the higher level groups, this emotional unity is seen in such things as the morale of competitive teams. One corollary to the principle of emotional unity is to be observed: the rivalry of individuals. This rivalry, however, constitutes no exception to the general principle of emotional unity; it is a by-product. For example, two salesmen on the same team in a sales contest may be competing with each other for a bonus and at the same time fit into the pattern of group motivation.

(3) *Brevity*. An army is a group which apparently acts as a group unit over fairly long intervals. A city or town seems, super-

¹ *Ibid.*, p. 260.

² *Ibid.*, p. 261.

ficially, to be a continuously associating group. Actually, even in the case of the army and the city, true group action is rather transitory. The city dwellers, although closely grouped geographically, act as individuals much of the time; the army acts with a definite common objective only a small percentage of the time except in case of war. Therefore, brevity may truly be regarded as a characteristic of group action when by "group" is meant one particular group.

NATURE OF GROUP BEHAVIOR

The three attributes which group action possesses—*reciprocal reinforcement*, *emotional unity*, and *brevity*—imply no mystic overmind. They are rather the results of the reaction of human social units in the presence of each other. For practical purposes, we may agree with even the most metaphysical of the writers on social interaction to this extent: group action does exhibit certain characteristic attributes. However, the individual's behavior in the group may well be merely the interaction of the organism and a particular type of complex environment. The behavior of the individual in the group, then, follows the usual definitive psychological principles, such as summation and facilitation, governing conduct in general. Of course, the group presents a particular kind of environment, and one which vigorously augments certain conduct directions and strongly inhibits others. In our subsequent discussion of social behavior and adjustment we shall be seeking intelligent applications of established laws of behavior rather than explanatory principles peculiar to the conduct of the group.

GROUP CONTROL OF THE INDIVIDUAL

Many of the world's maladjustments arise, not so much from the wilful floutings of society by the individual, as from the ignorance of group standards. We can observe this frequently, at first hand, by noting the difficulties in which an unsophisticated stranger in a new group can quickly involve himself. It is therefore to the point, in a discussion emphasizing adjustment, to consider group

controls. It is not intended that our list of these will be complete. It is, however, illustrative of the major types.

(1) *Government*. Even small groups, such as the family—and the family even in primitive society—exhibit a tendency to governmental form. Sometimes the form is patriarchal; sometimes matriarchal. As the group increases in complexity, governmental forms likewise become more intricate.

To many, government is a necessary evil. Even some of our New Dealers, who hold for a rather extensive governmental regimen both of economic and personal affairs, admit this necessary-evil feature. The extent to which the individual may control the group through governmental agencies has long been a topic of bitter debate and probably always will be.

(2) *Religion*. Religion is properly regarded as a highly personal matter. Its obvious institutionalization, however, makes it necessary to include it as a form of group control. In the past it has frequently been allied with government in probably the most powerful control which the group can exert over the individual. The high incidence of Mohammedans of Mohammedan parents, Catholics with Catholic parents, and Lutherans with Lutheran parents, is patent evidence of the social momentum which is attained. In so far as religion itself exerts an influence and a control over the individual's life, just so far is that influence likely to be exerted in the direction of the particular group into which the individual is born.

(3) *Conventions*. Conventions, as we ordinarily think of them ("coenotropes" as they are called by E. R. Guthrie), are more diffuse, less binding than laws, partially transitory, and considerably varied from place to place. Nevertheless, conventions constitute a powerful form of social control which the individual, in his process of self-adjustment, cannot afford to ignore lightly. The question of conformity and nonconformity will be discussed in a later section.

(4) *Superstition*. Something has been said concerning superstitions in our previous discussion of pseudo-psychology. A superstition may be loosely defined as a fairly systematized false belief, rather widely held. The interesting thing, psychologically, about

superstition is that as a conduct control it is just as effective, just as well reënforced emotionally—and often more so—as the most experimentally grounded scientific truth that exists. The error which many commit in dealing with superstitions is failing to recognize this. One's awareness that his associates hold false beliefs does not exempt him from equally erroneous convictions or from the effects of superstitions held by others. A baseball player who attributes a hitting streak to the socks he is wearing will persist in wearing them even though he becomes an olfactory menace. To interfere with many of the notorious and genuine superstitions of athletes—who, of course, have no corner on superstition—is to court disaster. Superstition, although false by objective standards, is, as a physiological and psychological phenomenon, a reality.

(5) *Rules and regulations.* Rules and regulations are often related closely to conventions. By rules, we mean those conduct controls laid down, not as the legislative voice of the whole group but as a control device of some smaller group, usually in no conflict with major social legislation. Violation of rules will seldom get one into jail, but will frequently make him a cynosure, or effect his ejection from a restaurant or hotel. An experienced manager of a large theatre says that rules are the thin lines dividing the audience from the mob. When the theatre is on fire, the line is often erased. Rules may annoy us at times, but they are necessary for the orderly regimentation of social groups.

INDIVIDUAL CONTROLS OF THE GROUP

History records numerous instances of the control of groups by individuals, and all of us can supply many more from our everyday experience. The ability to control groups is an accomplishment of social value, whether it is exercised by the head of a nation or by the head of a family. Psychological analysis indicates that this control may be brought about in a number of different ways. Some of them follow:

(1) *Personality.* In our discussion of personality, we indicated that, in part, personality is cultivated. Appearance, conversational facility, habits of approach, are all personality factors that are

significant in an individual's control of groups, and all are susceptible to analysis and alteration, to the end of making that control more effective. The factor of sex also unquestionably affects such control, as the historic occasions when an infatuation has radically altered the course of events and changed the personal destinies of many people testify.

Personality, as a method of group control, should be especially interesting to those who live in a democratic society, because in a democratic society everyone has an opportunity to advance. If advancement in the world depended entirely upon some such factor as hereditary wealth, progress for the majority of people would be difficult. With personality as a powerful method of group control, and with personality somewhat within the control of the individual, the case becomes radically different.

(2) *Language*. Merely as a communicative medium, language implies strong possibilities for group control. But when it includes, as it does, a wide variety of psychological attributes, it becomes a powerful instrument for achieving such control. For example, it is generally conceded by psychologists that thinking and language are closely related. Therefore, he who is a good arranger of words is in a position to influence the thinking of others.¹

(3) *Deceit*. Trickery has always been recognized as effective, if somewhat unethical, psychological maneuvering. In fact, some biologists go so far as to maintain that man's only real psychological accomplishment, and the only real difference between man and some lower animals, is his perfection of the art of deception. However this may be, it is obvious that deceit is a common means of group control by the individual. The violence with which society punishes spies, double-crossers, stool-pigeons, and others of their kind, is eloquent testimony of the completeness with which deception can succeed, and of the extent of the emotionalization which such success arouses.

¹ On this subject see: Alfred Korzybski, *Science and Sanity*, International Non-Aristotelian Library Publishing Company, 1933; C. K. Ogden and I. A. Richards, *The Meaning of Meaning*, Harcourt, Brace, 1925; and Sidney Adams and F. F. Powers, "The Psychology of Language," *Psychological Bulletin*, vol. 26 (May, 1929).

(4) *Wealth*. It would be unrealistic to ignore wealth as a means of group control. Money is power, so the saying goes, and he who controls money controls power and the action of groups. A recent editorial in the *American Mercury*, discussing the force that holds political parties together, somewhat cynically emphasizes this point in the following words: "Grover Cleveland named this force so correctly and so happily that it is hard to think he was not inspired when he did it. He called it the cohesive power of public plunder."¹

It has been the fashion, of late, to condemn categorically the power of money. This is unfortunate. In so far as wealth represents the fruits of effort on the part of the individual, which even approximates the extent of the wealth gained, the derived power is earned and the person has a right to exercise it. There remains naturally the substantial question as to how much money one man could actually earn in a lifetime. Is, for example, the inventor of some socially beneficial process entitled to fabulous royalties when such income makes him wealthier than he could have ever hoped to be by daily but uninspired efforts? The answer to questions like this usually resolves itself into a social compromise but does not invalidate the legitimacy of earned wealth as a social control.

(5) *Leadership*. Many psychologists believe that leadership is a meaningless term. They say that it is vague and generic and to have meaning must be broken down into specific conduct. Nevertheless, the same psychologists would probably agree remarkably well in picking out world leaders of today.

Leadership is really a name which we give to a combination of several kinds of conduct. As a method of group control, leadership is largely a learned art. The leader is usually in contact with the world of reality. Some would say that he is an extrovert. He knows the likes, dislikes, attitudes, and prejudices of his fellow man. He usually has facile command of language, often some wealth, and not infrequently skill in deception. In a democratic society considerable attention should be paid to training for leadership in the school program.

¹ *American Mercury*, September, 1937, p. 99.

SUGGESTION

Suggestion is perhaps the most powerful of all psychological controls. The basis, simply put, of its effectiveness as a control is the strong human tendency to follow docilely a strongly indicated line of action. The magician, when he wishes to execute the technique of a trick with his left hand, often swings his right arm in an expansive arc, and says in a loud voice, "In my right hand you see I am holding. . . ." The motion, which the human eye tends to follow like a kitten chasing a ball of yarn, is reënforced by strong auditory stimuli.

When emotionalization has reached a high pitch and when it is reënforced by the pressure of the group on its members, suggestions are likely to result in immediate and powerful action. If the suggestion happens to be in line with the predominating group inclination, and shrewdly made, as suggestions usually are, it evokes action all the more quickly. The mob milling around the jail, in which there is confined an individual suspected of some gruesome crime, often reacts too readily to the suggestion, "Let's lynch him." The same suggestion given in a relatively dispassionate fireside discussion of the same situation would probably receive less enthusiastic acquiescence, if indeed it were not considered repulsive.

Suggestion is used, not only to precipitate lynchings, but also as an effective social agent in far happier areas. For example, it is an excellent educative technique. Many a child who would react adversely and negatively to coercion may be influenced by suggestion. In situations where social relations are somewhat strained, necessary criticisms may be avoided by the substitution of suggested improvements.

In using suggestion as a social technique, an individual should bear in mind: (1) that suggestions are most readily acted upon when they point in the direction of an individual's or a group's existing interests; (2) that suggestion works most effectively when a condition of emotional reënforcement for the line of suggested action already exists; (3) that suggestions given by the individual

to groups are more likely to be followed if the ulterior motive of the person making them is not too obvious.

CONFORMITY

The question of conformity always arises in any discussion of social behavior and adjustment. It is closely related to the problem of group controls of the individual. It has been pointed out that group controls in the form of conventions or laws are often rather rigid. The individual must choose whether or not to accede to the mandates of these social controls in the process of living with others.

It is not possible to bring beautifully controlled laboratory results to bear on a problem such as this. Only to one who has a lively imagination and highly developed inferential facilities does the behavior of raccoons on inclined planes suggest practical principles for social conformity. But, like so many other problems of real life at which the purist in psychology often scoffs, this problem of conformity must be considered. Furthermore, the confession that exact laboratory data are not available is in no sense an admission that it is useless to try to make a systematic study of human conduct in social situations.

This is a day of social and economic activity. Profound changes in political and economic life are taking place. In some circles mere nonconformity seems to be the fashion. Many of mediocre intellect and indolent disposition believe that they can stamp themselves as profound thinkers and worthy social reformers by objecting to everything that has had a permanency of status. With respect to the desirability of social change, however, two considerations, each with psychological evidence favoring them, are of moment:

(1) Our social heritage is the result of a long process of painful evolution. Social institutions and social customs, while not perfect, are the result of the painstaking efforts of the best minds of the ages working to effect practical solutions of social problems.

(2) Conformity to the main body of social traditions is the lesser of two evils. The greater evil is for an individual or group of individuals, however gifted intellectually, economically, and politi-

cally, to attempt suddenly to evolve a set of institutions and customs better in their entirety than those which we now have.

The foregoing dogmatisms, and they are frankly such, are not intended as a criticism of any political party, religious program, or social group. Furthermore, they are not intended as a blanket apology for the *status quo*. They are, rather, studied hypotheses as to what the true foundation of all social adjustment must be. These statements do not preclude progress, but they do imply that progress, in the long run, is best brought about by gradual internal evolution, rather than by fomented external revolution. Biologists tell us that the human intellect has not improved potentially for thousands of years, at least. Of course, the social heritage has grown enormously. This being the case, it naturally follows that the conscientious efforts of thousands of human intellects to evolve an effective social structure cannot be entirely useless. Psychological control of the human race has been pretty well plotted. *Improved social adjustment is more a problem of willingness to abide by known principles of effective living than of discovering new ones.*

Reasonable conformity seems, then, to be a sound psychological basis for social adjustment. The writer has known many instances of young people whose lives have been wrecked by nonconformity indulged in for its own sake. We can all of us admire the martyr, who is willing to shatter himself on the stubborn wall of social resistance, when there is in his heart a burning resentment and in his mind a clear, even though it be a destructive, philosophy; but the immature negativist, who has not even made a serious intellectual effort to analyze the nature of social adjustment and social progress, would be a humorous spectacle if his shattering were not so pathetic. The true liberal and the occasional really brilliant analytical radical will always have a place, for society cannot remain static in its organizations and adjustments any more than the individual.

CAUSES OF SOCIAL MALADJUSTMENT ¹

First of all, in considering the causes of social maladjustment, it should be pointed out that, in most cases, social maladjustment does

¹ The general treatment of the psychology of adjustment, as given in

not involve a different species of human being, the "maladjusted." Maladjustment is a matter of definition only. It is behavior which lacks social sanction. But it is just as serious to the maladjusted individual as an organic derangement, and a good physician is often far more difficult to discover.

Some light is thrown on the major phases of the problem by a consideration of the several causes of social maladjustment. No one cause is responsible for all cases of maladjustment although it may well happen that a combination of causes brings about the damage. The following bases are both widespread and psychologically significant:

(1) *Intellectual handicaps.* Society today is not a simple thing. It consists of an extensive variety of institutions, customs, rules, and taboos closely interwoven and touching the life of the individual in many places. In society in general, but especially in large urban centers, these closely interwoven factors function dynamically in an atmosphere of hurry, noise, and confusion. To adjust to this type of situation, both intelligence and nervous control are necessary. Consider, for example, the type of adjustment necessary for a stock market operator on Wall Street. In an environment which frequently borders on pandemonium, he must retain enough temperamental tranquillity to think clearly and to pass numerous judgments on short notice. It is no wonder that many fail to meet the test.

Without any intention to justify or condone criminality, it would probably be psychologically correct to say that much present-day crime is the result of the sheer inability of many to grapple intellectually with the rapidly moving problems in modern society.

(2) *Faulty early training.* Not all social maladjustment is due to intellectual incapacity. Early associations and early conditionings play a vital rôle. For example, what a handicap parents give their children, who allow them to have their own way in all situations! What a poor picture of society these children get! No wonder, Chapter V, is the foundation and introduction to the present treatment of social maladjustment. What we propose to do at this point is to make a definite application to social situations of the general principles of adjustment. A review of Chapter V is recommended.

in later life, that their infantile behavior brings them into ceaseless conflicts with society and forces them to needless defensive maladjustments. The home and the school should contain, in varying proportions, all the psychological elements the child will find later in adult society.

(3) *Social mobility.* Investigation of the mobility of population in the United States indicates, in both industries and schools, that in some areas and in certain kinds of economic conditions, such mobility is very high. The children of those who have moved frequently from one community to another are likely to have difficulty in school. They are often socially maladjusted. This is no reflection on the school or the child. It is evidence of the fact that social adjustment is a fairly specific thing, and it requires a rather specific analysis of the particular situation in which one is functioning. Frequent changes, particularly to communities of different racial, industrial, and social composition, often present the child with a serious adjustive problem.

(4) *Negativism.* The psychological phenomenon of negativism is not too well understood. Common parlance recognizes negativism as "block-headedness." The negativist is a chronic objector. He always wants to do the opposite of what the group is doing or what some individual wants him to do. It takes no profound reasoning to come to the conclusion that this is not an ideal trait to possess, if one wishes to be socially well adjusted.

(5) *Economic misfortune.* Children from poor homes are often found to be socially maladjusted. It would be unfair to ascribe this either to lack of intellectual capacity or to temperamental instability. Adjustment of any kind is partly the function of experience and contacts, and these are naturally severely limited by straitened economic circumstances. President Roosevelt has often emphasized this point in his demand for the raising of the general economic level of the United States. The objective of such a progressively raised economic standard is not only to furnish creature comforts to all citizens, but also to improve their social adjustment through economic advancement. There can be but little question that the two are definitely related, and it must further be candidly

admitted that there is a definite limit to the improvement that psychology and psychiatry can effect, without the valuable concomitant of economic betterment.

(6) *Social pressure*. Society may be likened to a school of sharks which turn upon a wounded member and devour him. Such is social pressure. It falls with devastating force and suddenness upon those least able to endure it. There is no uniformity in the stresses and strains to which individuals are subjected. Americans are traditionally against standardization and regimentation. But it might be a good thing if society could, by some device, provide a mechanism whereby the young are more gradually subjected to its rigors. This may sound like a beautiful generality, but, as a matter of fact, actual steps are being taken in this direction. Leading thinkers in this field, such as Dean J. B. Edmonson, are advocating a much longer period of schooling for all children in the United States. Since the school is something of a protective agency, this lengthened period of schooling would bring about a gradual introduction to social pressures.

TYPES OF SOCIAL MALADJUSTMENTS

In spite of any program of education which can be set up, it is inevitable that the individual will become, at times, the object of severe social pressures. To this pressure, different individuals react differently. Various classifications of these reactions are given, some lengthy, some brief. Many social maladjustments, however, may be classified under about three headings:

(1) *Flights from reality*. Watson and Spence¹ have pointed out that human beings tend to orient themselves negatively when social stimuli involving failure, thwarting, disappointment, etc., confront them. Flight, literal or figurative, is one sign of negative orientation. Of course, it is not strictly correct to call the flight a maladjustment, for sometimes it solves the problem. For example, a person who is maladjusted in one community, either because of present misfortune or past record, can sometimes solve his

¹ Goodwin Watson and R. B. Spence, *Educational Problems for Psychological Study*, p. 326. Macmillan Company, 1930.

problem by moving. Likewise, the offensive extrovert may solve his problem by a personality regression. Frequently, however, the flight itself serves no utilitarian purpose, except to discommode the person, or to carry him farther still from realities, which he must eventually face to make an adjustment.

(2) *Overcorrection*. Overcorrections, as social maladjustments, are illustrations of a good thing done to death. The overtalkative child, upon being corrected, sometimes sulks and will say nothing for a long time. The overquiet child occasionally becomes a chatter-box as the result of efforts to overcome his reticence. Reformers occasionally offer painful examples of overcorrection. Generalizing, we may say that overcorrection is a social maladjustment brought about by abnormal behavior which itself is the antithesis of the original difficulty.

(3) *Deceit*. Ironically enough, deceit is often resorted to originally to make social adjustment easy. Generally speaking, it is a line of least resistance. It most often results in maladjustment when circumstances necessitate functioning in one situation over a considerable period.

THE GENERAL TECHNIQUE OF SOCIAL ADJUSTMENT

We may summarize our point of view of this chapter on social adjustment by three generalizations concerning it: (1) social adjustment depends upon a sense of social reality and a studied recognition of social values; (2) social adjustment necessitates knowledge of social mores and their correct evaluation; (3) social adjustment thrives through progressive self-analysis and improvement.

QUESTIONS

1. Name the group controls of the individual and give illustrations of each, other than those in the text.
2. Can you add any items to the list of individual controls of the group?
3. What is the place of suggestion in social adjustment?
4. In what kinds of nonconformity do you think the individual is justified?
5. Discuss causes and types of social maladjustment.

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CHAPTER XI

CHOOSING A VOCATION

THE PROBLEM OF VOCATIONAL CHOICE

Choosing a vocation is a difficult problem, as any student who is still floundering in indecision in the sophomore, or perhaps even in the senior, year will testify. If more evidence is needed, consult the student who has "always" planned to be an engineer, but who is discouraged by his adviser because of poor grades in college mathematics and science; or the would-be musician who finds his talent is only mediocre; or the medical student, dropped at the end of the first year of the professional course, who must make a complete vocational readjustment. Even the fortunate person who has many capabilities and interests often finds choice perplexing.

Vocational problems rank high in every study of the adjustment needs of college students. In one institution which gave required sophomore courses in vocational orientation for men and women, an outside counselor found that occupational choice still was the most frequent subject of guidance interviews with upper classmen. No more important task confronts the college student than a choice of his life work. This is not to say that making a living is the chief concern of human beings. Nevertheless, happiness and effectiveness in nearly every other life function are dependent upon satisfactory occupational adjustment. One cannot plan for marriage and homemaking until he has selected an occupation and made specific plans for entering upon it. The continued success of the home very frequently rests upon progress in the vocation. Adequate occupational adjustment is conducive to personal satisfaction, a sense of personal worth, and the zest which comes from mastery and control. Vocational dissatisfaction, on the other hand, may result in a sense of frustration and thwarting, of personal insufficiency, and a devastating consciousness of failure. The

well-being and poise which attend success and pleasure in work flow into a wide range of social adjustments. Finally, one cannot determine how to discharge his responsibility for the general social good without reference to his vocation.

Oversimplification of choice. Many students enter college without having chosen a vocation. A study at the University of Chicago showed that one-third of the freshmen entered without a vocational objective.¹ This is not necessarily unfortunate, for one of the purposes of higher education is to aid in occupational orientation. Furthermore, many who have decided on a career may have made unwise choices, and should evaluate their conclusions carefully.

There is a striking tendency for college students to oversimplify the problem of vocational choice. Lists of occupations have included from five hundred to more than twenty thousand titles, depending on the extent to which vocational fields have been broken down into specific positions. In spite of this great variety, however, vocational choices center around a few socially preferred professions without regard to the actual distribution of workers in society or to the aptitude of the individuals for the occupations. From 1929 to 1933 the occupational choices of high school seniors in Minnesota were grouped according to the following classifications, which represent a hierarchy of intelligence in vocations:

<i>Classification</i>	<i>Illustrative Occupations</i>
I. High professional and executive	Engineer, editor, inventive genius, lawyer
II. Lower professional and large business	Accountant, bank official, dentist
III. Technical, clerical, and supervisory	Building contractor, railroad clerk, master mechanic
IV. Skilled tradesmen and low clerical	Lithographer, mechanic, painter, paperhanger
V. Semi-skilled	Railroad fireman, hospital attendant
VI. Unskilled	Hostler, garbage collector, day laborer

¹ R. C. Woellner, "College Freshman Vocational Selections," *Junior-Senior High School Clearing House*, vol. 8 (September, 1933), pp. 33-35.

Groups I and II accounted for 48 per cent of the men in 1929 and 38 per cent in 1933. Group III, which includes the average types of work to which many of these students will have to adjust, accounted for only 11.7 per cent by 1932.¹

The students of Long Island University in 1931 had chosen only twenty-two different occupations.² Ninety-five per cent of them chose medicine, dentistry, law, and teaching. Another study of the vocational intentions of 4246 seniors in forty-five Pennsylvania colleges revealed that three-fourths of these persons had chosen the professions, and less than one-fifth trade or business pursuits.³ The percentages, of course, are at wide variance with those in the general population. Although somewhat exaggerated, perhaps, these are instances of an unfortunate general situation.

Disregard of intellectual fitness. Not only is there a tendency to limit choices to a few overcrowded fields, but these decisions are frequently made without regard to the intellectual capacity necessary for success. Williamson and Darley found that many Minnesota seniors of low aptitude had chosen a profession or occupation which demanded a high level of ability. The majority of Long Island University students expected to enter vocations in which they would have an intelligence handicap. Only 34 per cent of them had higher intelligence than the average person engaged in the occupation. Thirty-seven per cent were preparing for vocations involving scholastic preparation in which their grades were low. Grades of half those choosing medicine were too low for entrance to first-class medical schools. No wonder students shift vocational objectives during college. Unfortunately, many persist in unwise choices only to fail in the professional school, or in the vocation itself, or to become poorly adjusted to this work. A study of 2424

¹ E. G. Williamson and J. G. Darley, "Matching Abilities to Jobs," *Personnel Journal*, vol. 13 (April, 1935), pp. 344-352.

² E. J. Sparling, *Do College Students Choose Vocations Wisely?* Columbia University, Teachers College Contributions to Education, No. 561. 1932.

³ Hilda Threlkeld, *Digest of Educational and Vocational Plans of College Seniors in Relation to the Curricula and the Guidance Programs in Forty-Five Pennsylvania Colleges.* Columbia University, Teachers College Contributions to Education, No. 639. 1935.

graduates of Stanford University showed that 19 per cent would not select their present vocation.¹ Shifting one's vocation is a costly procedure when one enters it as late as does the college or professional school graduate. The most careful consideration of what to do will not insure perfect adjustment, but it will reduce dislocation materially.

Reasons for unwise choice. Unwise vocational choice may be due to many factors. Parental wishes often turn young people to work for which they are ill-adapted or for which they have little inclination; many times parents try to satisfy their own frustrated desires through their children. The uninitiated frequently romanticize certain occupations. "Doctors are seen in their most brilliant operations; no attention is given to the long hours of routine care of sniffing colds or painful boils. Enraptured youths believe that all a lawyer does is to deliver stirring pleas for the innocent and oppressed; forgotten are the tedious days most lawyers must devote to writing briefs and telling clients the meaning of their used-car contract. All engineers are thought of as builders of the Boulder Dam; but there is only one such to the thousands of engineers who do nothing more dramatic than to construct post-offices on Main Street."² As already noted, many persons who choose the professions or high executive positions do so because of social preference or supposedly high financial return rather than because of real capacity for the vocation. Many persons have highly exaggerated ideas of income from most of the preferred occupations. In one university the men interviewed about vocations expected to earn four times as much money as workers in the field they were choosing actually earned. There is plenty of evidence that many students decide on vocations without a realistic knowledge either of the occupations or of their own qualifications for success, or of the avenues of entrance to the positions they desire. Some persons make choices entirely on the basis of incidental or extraneous cues. One boy reported that he had chosen medicine because he had helped to carry

¹ C. G. Wrenn, "Vocational Satisfaction of Stanford Graduates," *Personnel Journal*, vol. 13 (June, 1934), pp. 21-24.

² E. G. Williamson, *Students and Occupations*, p. 15. Holt, 1937.

away the remains of the victim of a horrible railroad accident without fainting! The inference supposedly was that because he could tolerate the sight of blood and human suffering he could become a successful surgeon. He also harbored the glorified image of a surgeon in a white uniform performing dramatic operations while white-froked nurses and internes jumped to his staccato commands.

Attacking the problem. Not only should students who have not made a career decision engage in a systematic study of the many factors involved, but those who have chosen might well evaluate the bases upon which the decision was made. In the process of analysis, one ought to give realistic answers to the following questions as a minimum list:

1. What level of general education is expected of people who enter this occupation? Have I the necessary schooling or can I acquire it?
2. In addition to general schooling, how long a period of specialized education or training is ordinarily necessary? Where can I secure it, and what will it cost?
3. What measure of intelligence or mental alertness has been found to characterize the people who enter upon and make progress in the occupation? Do my general mental abilities resemble those of persons in this field?
4. Are any special talents or aptitudes necessary? If so, are they a part of my endowment?
5. Specifically, what kinds of activity are most characteristic of this occupation? Do I like to do these kinds of things? Would I find the work and the surroundings congenial?
6. What are the average annual earnings of people in this occupation? At what rate would I start, and what income might I eventually expect? Are there exceptional rewards at the top?
7. Is employment relatively secure and steady, or intermittent, seasonal, hazardous?
8. What are the opportunities for advancement? Is this a blind alley, or does it open doors to other occupations?
9. What is the ratio of employment opportunities to the supply of competent applicants? How keen is the competition I would face?
10. Where does this occupation rank in social prestige? If I were to

succeed in it, would my friends applaud, or would they look down on me for following this calling? ¹

Aptitude for engineering. The following analysis reveals how complicated the matter of determining vocational aptitude is, and, at the same time, suggests the folly of naïve decisions:

A counselor engaged in helping a young man to decide whether to undertake a course of training for any of the engineering professions brings together for appraisal the evidence as to his interests and ambitions, and as to his aptitudes, particularly his general scholastic aptitudes for learning mathematics, for thinking about space relations, for understanding mechanisms, and for mastering the physical sciences. Superiority of performance in those school subjects and in tests known to be indicative of these five kinds of aptitude furnishes the evidence of capacity to succeed in the study of engineering, and when coupled with a liking for engineering work and the necessary health, energy, drive, and constancy of purpose, indicates a high probability of success in the practice of an engineering profession.

Low scores in any of these measures of aptitude should be construed not as definitely barring from further consideration the possibility of a career in engineering, but as warning signals, red flags of caution on a road which is still open but which is entered at the traveler's own risk, after he knows just what the hazards are. . . .

A lack of equipment in the verbal tools of thought, revealed by low scores in tests of vocabulary and of English usage, may signify either insufficient training in the clear and precise use of language, or a shortage of verbal intelligence without which it is difficult to master college subjects.

A very superior performance in verbal intelligence tests and in literary subjects may also be regarded with some suspicion if the person's linguistic talents all seem to be definitely more outstanding than his mathematical and scientific abilities. Students whose scores in tests of vocabulary and verbal intelligence are even higher than their very good scores in mathematical reasoning and scientific aptitude are prone to become restive in a college of engineering, to drift off into more liberal curricula, and eventually to choose a career in some profession like journalism, law, or teaching. A student whose superior verbal and mathematical apti-

¹ W. V. Bingham, "Vocational Bents," *Occupations*, vol. 15 (October, 1936), pp. 15-21.

tudes are coupled with marked capacity for spatial thinking and a flair for artistic design not infrequently abandons engineering to prepare for a career in architecture.¹

Basic principles of vocational choice. Evidently, choosing a vocation is a complicated task. One should make the decision, upon which so much of personal happiness and of social integration depends, after a process of deliberate analysis. Below are some basic guiding principles.

1. *Beware the fallacy of the perfect niche.* While it is true that individuals vary greatly in vocational aptitudes, there is no one job for which a given person is ideally fitted. One may have many abilities, and one may use them in many different kinds of work. Williamson explains the situation as follows:

Suppose one has shown skill in reassembling the family clock, or in high school shop courses. One cannot, therefore, conclude that engineering is the only career in which such ability can be used. As a matter of fact, that same mechanical dexterity might be used in surgery, or dentistry, or engineering—providing one has the other abilities demanded by these professions. And if one does not possess these other essential aptitudes, no amount of mechanical ingenuity will guarantee a successful professional career in any of these fields. On the other hand, a careful study will reveal many occupations in which mechanical abilities constitute a distinct asset even when not accompanied by a penetrating mind and capacity for abstract thought.²

More frequently than not, it is easier to determine what occupations one should not choose, because of deficiency in general ability or essential special aptitudes, than just what one should be selected. In estimating vocational fitness, one should draw up a table of assets and liabilities, and strike a balance.

2. *This balance of assets and liabilities should be taken as a trial balance.* Although it is desirable to base judgment as far as possible on objective measurements of aptitude, interest, and personality, no battery of examinations will give a completely reliable measure

¹ W. V. Bingham, "Engineering Aptitudes," *Occupations*, vol. 14 (December, 1935), pp. 197-202.

² E. G. Williamson, *op. cit.*, pp. 16, 17.

of these factors, and tests do not exist for a complete inventory of traits and abilities. Furthermore, there are very few tests upon which one may predict the performance of vocational activities in their true setting. These limitations do not preclude the use of objective data in self-analysis for what they are worth. The human errors in self-evaluation make such measures highly necessary, in fact. But no battery of tests, and no counselor or counselors, can determine with exactness what one should do. When all the science of vocational prognosis has been applied, a considerable hazard remains.

3. *It is easier—and in the case of many occupations it is sufficient—to determine aptitude for training than to predict vocational performance as such.* Academic success in high school is indicative of success in college; achievement in high school subjects is a fair index of scholarship in the same field in college. There are many errors in this type of prediction, of course, since high school grades are not comparable from school to school, and outcomes stressed in college may differ considerably from those emphasized in the secondary school. For this reason, it is wise to supplement scholarship data with the results of objective achievement tests which provide summaries of the scores made by a very large and representative sampling of high school and college students. To these may be added tests of aptitudes for specific subjects like chemistry, mathematics, and foreign language. The first semester's grades in college are the best single means of prediction for the first year, and the results of the first year the best single prognostic index of subsequent work. Here and there a student who does poorly at lower levels more because of lack of interest and effort than because of insufficient ability may find himself and take a sudden turn for the better, but such cases are exceptions to the general trend. Furthermore, it is fairly easy to determine whether one's intentions are mere wishes or hopes by the administration of a battery of objective mental tests.

Needless to say, it is important for the student who plans on medicine, law, engineering, or some other occupation in the high intelligence and scholastic achievement category, but whose chances

of success in training are few, to find out about it as early as possible. Failure generates more unhappiness and maladjustment than frank recognition of limitations. Happiness results from a successful relationship of ability and occupation. Fruitless or discouraging attempts to attain goals which must always remain beyond reach dispose only to disillusionment and frustration. Social prestige, also, is more likely to follow success and mastery, and self-satisfaction comes only with control.

4. *There is a series of personal characteristics, difficult to measure but real, nevertheless, which, in addition to training and aptitude, condition success in a vocation.* All vocations and all employers stress the importance of such qualities as tact, courtesy, punctuality, accuracy, thoroughness, willingness to learn, good personal appearance, good posture, and good health.

5. *It is safer to work from aptitudes to vocations than from occupations to aptitudes.* Vocational information is highly important in occupational choice, but it is costly to make a decision in terms of the advantages in the work rather than in terms of demonstrable personal characteristics. First, inventory aptitudes, interests, and attitudes. Then look for vocations in which these individual characteristics can be effectively applied. In this search, widen the range of choice by considering a great variety of specific occupations.

If one works from vocations to abilities there is always the temptation to make one's analysis of personal traits fit the occupational needs. It is easy to mistake ambition for aptitude. But one is much wiser to rest upon fairly well demonstrated abilities than upon his wishes, or upon a theory that if one works hard or long enough, he can acquire the necessary aptitude. Effort and attitude supplement aptitude and make it effectual, but they do not create it or usurp its rôle. It is improvident to fix one's desires upon a goal without realistically deciding whether one can reach it and how. The old adage, "Hitch your wagon to a star," leads us to place too much dependence on the star. This is not to disparage ambition, or vision, or long-deferred objectives. These are dynamic factors in behavior. The thesis simply is that attainable goals lead to lasting satisfactions. Purposes should not be so easy of accomplishment

that they do not extend one's possibilities, it is true; neither should they be so difficult that ability should be found wanting.

6. *Vocations should aid deliberate compensation to the extent that they capitalize one's strongest aptitudes, but they should not be chosen as mechanisms of escape.* Occasionally, individuals obsessed by an unnecessary sense of guilt, or depressed by failure to achieve success in school or in social contacts, go into religious or social work as means of compensating for remorse or inferiority. There is no reason why one should choose such fields of work with any less rational or objective assessment of assets and liabilities than one should employ in connection with any other vocation. There are probably as many misfits (or more, because religious institutions usually soften the ruthlessness characteristic of competition in secular vocations) in religious work as in any other occupational field.

7. *Occupations are usually classified in terms of the general functions which they perform as a whole.* Such terms as "the law," "manufacturing," "architecture," "business," and so on, ignore the widely varying and greatly different particular functions which are performed by workers in a given occupational field. Architectural firms, for instance, may employ creative artists, draftsmen, designers, engineers who can translate design into structural detail, men assigned to secure contracts, and men to supervise letting of contracts. In approaching an occupation, one should first see it as an integral function, then determine its major divisions, and finally become conversant with more detailed type activities and positions.

8. *Occupations vary in the relative proportion of broad types of aptitude necessary for success.* Mathematical ability is desirable for accountants but indispensable for actuaries. Mechanical aptitude is necessary for engineers, but abstract intelligence is even more essential. For aeronautic mechanics, mechanical aptitude and manual dexterity probably transcend verbal intelligence in importance.

9. *General training is essential both in and out of the special vocational field.* Economic, social, scientific, and population changes alter vocational patterns with amazing rapidity and inexorable certainty. Broad vocational training which emphasizes the founda-

tions of specific performances and processes is essential for versatility and adaptability. For this reason it is wiser to think first of occupational fields rather than of specific jobs within a field. The student who wishes to become a civil engineer, for instance, will do well to acquire first the broadest kind of engineering training. The experience in the professions and in industry is clear: Don't specialize too soon, and don't bet a life career on one narrow field of work, because it may disappear or change radically in character. Not only may one find it necessary to make many adaptations within a special field, or shift from one type of occupation in the broad field to another one, but one may even have to change from one field to another. If there are qualities, abilities, or skills common to many occupations, one should emphasize the common elements to the greatest possible extent.

Many students with decided vocational goals take general non-vocational courses impatiently. Much of this general training, however, may have an occupational value. The engineer finds that skill and effectiveness in English expression are invaluable. Frequently, he manages men, and needs a profound knowledge of human psychology and labor problems, and social understanding. Engineering is intimately related to economics. It is surprising, too, how much liberal studies, even the arts, may contribute indirectly to vocational efficiency. Industry is taking a new interest in artistic products. Packages are designed by artists, and the most utilitarian objects are now often artistically styled. Some acquaintance with art might be very profitable to the business man or industrial engineer.

The statement that man cannot live by bread alone becomes less trite with every addition of leisure. One can seldom live a satisfactory life without adequate occupational adjustment and success. It is equally true that vocational proficiency alone will not fulfill the varied and insistent needs and demands of human personality. It is the writer's observation that some of the most satisfying lives are those with a wealth of interests and activities. He knows a great geologist who has a beautiful flower garden in which he has developed several new forms of iris, who has the

largest collection of fine phonograph records in the whole area, who has written critical reviews of the modern novel, and is now contributing articles on economic problems. A man is lost without a job, but he should not be lost from the world within a job.

10. *Keep in mind the limitations which circumstances impose.* Financial stringency may make professional education in law or medicine unfeasible. Women have great difficulty in entering certain occupations in spite of aptitudes comparable to those of men. It pays to consider occupations which are just opening up through new inventions or new consumer needs, but it is provident to plan for other work until openings become numerous enough to make one feel fairly sure of the desired position.

SECURING VOCATIONAL INFORMATION

The recommendation to attack the problem of vocational choice by inventorying one's personal characteristics should not obscure the importance of securing specific and reliable data about occupations. Again, one should remember to explore widely among many fields of work and to get information about the whole range of performances involved.

Books about occupations. A selected list of books describing a variety of occupations is appended to this chapter. It does not exhaust, by any means, the valuable sources. However, since conditions in certain fields change rapidly, one should be careful to use up-to-date references. Although books seldom provide enough detailed information, they do usually offer a skeleton outline which may be filled in from additional sources. A deliberate attempt should be made to get a good idea of the abilities which are necessary for successful performance. In securing information one should cover some such outline of topics as the one on page 256.

Biographies. Work may be more meaningful when we see it through the experiences of persons who have been successful in their vocations. Biographies and autobiographies help to identify both obstacles and means of advancement, motives which have stimulated choice and accomplishment, and the experiences, train-

ing, and personal traits necessary for satisfactory participation. One should remember, however, that biographies usually are written about unusual people, and that they may dramatize vocational functions unduly and, in fact, give a distorted idea of an occupational field.

Tryout experiences. Part-time employment, summer jobs, and the classroom itself may provide valuable exploratory experience. Campus jobs and even extracurricular activities should be exploited for guidance. Students interested in library work should try to secure part-time positions in the college library. Secretarial jobs offer valuable vocational experience. Work on the college newspaper, writing special features or routine news for one's home-town weekly or daily while in college, and selling advertising for the year book not only are valuable exploratory activities but also give one access to a great deal of vocational information. One college English department publishes a series of chapbooks hand-set and bound by students. Valuable experience in editing, layout, and design is gained by students who participate. Recreational leadership, magazine illustration, commercial art, salesmanship, costume design, institutional management, and advertising are illustrative of occupations in which students may secure more or less experience or contact in college. Practice teaching is useful not only for training in classroom procedures but also, and perhaps primarily, as a means of exploration of interest and aptitude.

Many students attempt to secure summer employment in which actual experience or a point of vantage for observing occupations may be gained. It frequently pays to take such jobs for nominal pay if the tryout seems valuable. Exploratory experience is more valuable if one secures from books and other persons as much information as possible before going into the job.

In many fields the activities of the classroom and laboratory simulate fairly well some vocational activities. In courses in mechanical drawing, surveying, mathematics, and physics, for example, the young engineer will find many pertinent problems and activities. Advance knowledge of vocations will assist in identifying these common situations.

Interviews. The guidance departments of colleges and universities might well arrange interviews with alumni and other persons who are interested in aiding students to secure vocational information. The student himself should take every opportunity to arrange such contacts. One should remember, however, that many persons are not well adapted for their work, that they may resort to the very human tendency to shift blame for their deficiencies to other people or to irrelevant circumstances, and that, even though well adjusted themselves, they may not be adept at identifying the aptitudes necessary for success.

Observational excursions. Many colleges are now arranging trips to a variety of occupational enterprises so that students may supplement verbal descriptions with first-hand observation. Again, this experience is most fruitful if one knows from previous study what to look for, in part at least, and what to ask about. One who is really interested in surveying the world of work can make a surprising number of contacts with different jobs and the persons who perform them.

Hobbies. Many hobbies or avocations lead directly or indirectly into vocations. A boy who rode his bicycle over the countryside looking for Indian relics is now one of the foremost archaeologists of the Middle West. A young teacher of classics, long interested in fossils and other phases of earth science, transferred to geology and has become one of the nation's authorities in the field. The present engineer of one of the largest broadcasting companies spent every spare hour as a high school student on radio. A young man interested in gardening became editor of a well-known magazine devoted to housing and gardening and the author of more than twenty books on the subject. An Oxford student whose hobby was chess now makes a living out of it as an instructor and as chess editor of a large newspaper. A girl whose chief leisure interest was coin collecting is now assistant to the curator of a metropolitan bank which has a collection of moneys of the world. Another young woman, who liked to draw, has become one of the most distinguished industrial designers.

Hobbies are worthwhile in themselves as leisure activities, but they also reveal interests, and frequently aptitudes. They may

also suggest novel ways to stimulate and satisfy consumer needs and wants.

Experience of faculty members. Faculty members with a vocational past are surprisingly numerous. Not all of them by any means have lived only in cloistered halls. One acquaintance has been a newspaper man, a publicity director, a merchant, and a play director. Another has been a consulting psychologist. Another was an accountant. One is, in addition to his teaching, a consulting engineer. One woman was a secretary in a large New York business house. Social worker, playground director, park naturalist, banker, dietician, illustrator, school superintendent, school psychologist, director of religious education, Y.M.C.A. worker, minister, industrial geologist, actor, tearoom manager, tree doctor—all of these are found in one small faculty's vocational history.

Altogether, the sources of vocational information are numerous and varied; it remains for one to take advantage of them. Not only is an occupational survey useful as an aid to the choice of a career, but it is a valuable sociological study as well. There is a fascination in knowing the world of work. It makes a substantial contribution to an understanding of contemporary civilization and a profounder knowledge of people.

SECURING PERSONAL INFORMATION

Necessity of objective analysis. All the information one can assemble about himself is not too much to scrutinize in making a vocational choice. For instance, he may be able to infer his interests to some extent from the occupational experiences he has had, from the educational activities he has engaged in, or from his hobbies. He may make a tentative decision as to whether he is more satisfied when working alone or with others, or when working with people or with things. He may be able somewhat roughly to estimate his ability in certain lines from these same experiences. Such estimates, however, are very likely to be faulty. Stellar performance in a college play may fall far short of superior acting on Broadway or in Hollywood. It is easy to get "stage-struck," but extremely difficult to break into the movies. One's estimate of his ability ex-

pands rapidly under praise which may be motivated mainly by politeness or cut to the size of local criteria. Selling insurance to one's close friends and relatives is not a very good sample of ability to sell to comparative strangers. Wherever possible, therefore, one should supplement other sources of information concerning his personal characteristics with objective tests and scales. The best of these instruments provide norms based on scores of fairly representative samplings of the general population or of restricted but defined groups. Comparing one's own score with those norms reveals relative status with respect to the functions measured. The same individual may rank in the upper tenth of a given high school class in mathematical achievement, for example, but fall below the average of scores made on the same test by many high school pupils in many different schools.

Value of cumulative records. Psychologists now realize that the most reliable personal diagnosis is that based on a cumulative record of the individual's achievements, aptitudes, interests, attitudes, and experiences. This array of data, in other words, gives a developmental picture of the individual, in which significant growth trends are revealed which would not be obvious when a battery of tests was administered at one time. The number of high schools and colleges which are keeping cumulative records for individual pupils is increasing rapidly. Where these data are available, they should be used to supplement any testing done at a single time for vocational prognosis.

Limitations of tests. We must use the results of objective testing only as far as they are known to be valid. The validity of a test expresses the extent to which it ranks persons as they would be ranked on a true measure or true criterion of the trait being measured. We have already noted that the correlation of intelligence test scores and college marks averages only about .5. Only to the extent of the relationship so indicated can such tests be used to predict general scholarship. They are less prognostic in some subject-matter fields than others. Academic success, obviously, depends on many factors, of which intelligence as measured by verbal tests is but one. Likewise, tests are useful for vocational prognosis

only to the extent that scores on them bear a known relation to degrees of success in the performance to be predicted or in the training required. One knows in advance that any test will predict subsequent performance in given functions imperfectly—some much more so than others. No testing program, supplemented by the best interview and judgment techniques, can provide an exact solution of vocational aptitude. We may fairly label anyone who promises precise solutions to problems of vocational choice on the basis of a few test scores and a fifteen-minute interview a psychological quack. It is equally true that no trained vocational counselor would make tentative evaluations of personal abilities without using to the extent of their validity the objective measuring instruments now available.

The following types of measures are now at hand for use in individual diagnosis: tests of general scholastic ability, special aptitude tests, trade and proficiency tests, achievement examinations in school subjects, interest inventories, scales of social attitudes, and measures of personality and conduct.

Intelligence and occupational success. The administration of the Army Alpha test during the World War revealed that there is a hierarchy of occupations based upon the distribution of intelligence test scores of workers in each vocational classification. The average scores fall from a peak in the professions to a low point in unskilled labor. Chart 1 (page 270), which is based on the Army Alpha test data, shows the way in which general, educational, and occupational achievement is related to intelligence levels. Table III (page 272) gives the average score for a variety of occupations, and the range of the middle 50 per cent. A great overlapping from one classification to another is evident. Vocational psychologists have attempted to determine for some occupations a lower critical score, the point below which there is a negligible chance of success. It is possible, also, that there are upper critical scores. In other words, if one has an intelligence score too far above the mean for persons in his occupation, he may become dissatisfied with the work. Personnel departments in some industries have discovered

that undue turnover results from employing persons too high in the intelligence scale, as well as those too low.

Aptitude tests measure ability to learn rather than occupational efficiency. More precisely, they predict the ability to learn the sorts of tasks which are included in the tests. The so-called general intelligence test measures abilities which are more important in some occupations than others. Thus verbal intelligence test scores are more highly related to success in professions and executive positions than in mechanical pursuits or in skilled or unskilled occupations. For this reason, Bingham¹ reminds us that "it is well to distinguish intelligence in using verbal concepts from intelligence in solving mathematical problems, in dealing with spatial relations, in manipulating mechanisms, and in managing other people."

Although many persons deny that typical verbal intelligence tests measure general innate ability, there is a lingering belief that the ability to deal effectually with language and abstract concepts is fundamental to learning capacity, to adaptation to new situations, and to the ability to solve unfamiliar problems. Where occupational performance depends upon these mental functions, and particularly where the work deals with abstract verbal and mathematical symbols, intelligence tests are of considerable importance in vocational prediction.

The student who chooses an occupation in which the average intelligence of the members is superior to his should do so only after a most conservative evaluation of the operation of compensating factors. There is little evidence to substantiate, from the point of view either of individuals or of society in general, the suggestion that each occupation should have in it persons widely distributed over the aptitude and proficiency scale. The individual who constantly measures short in competition, or the one who finds his work beneath his aptitude, is more likely to reap unhappiness than satisfaction. There is every reason to save society from the blundering of stupid doctors and inept lawyers. There is still more rea-

¹ W. V. Bingham, *Aptitudes and Aptitude Testing*, p. 58. Harper, 1937.

CHART I 1
CORRESPONDING INTELLIGENCE ACHIEVEMENT VALUES

Intell. Groups	A Very Superior 18.0 up Mental Age	B Superior 16.5 to 17.9 Mental Age	C+ High Average 15.0 to 16.4 Mental Age	C Average 13.0 to 14.9 (Estimated Average Mental Age 13.75)	C- Low Average 11.0 to 12.9 Mental Age	D Inferior 9.5 to 10.9 Mental Age	D- Very Inferior 7.0 to 9.4 Mental Age	E Useless 0.0 to 6.9 Mental Age
General	Intelligence for creative and directive effort	Intelligence for executive, business, leadership, and most professional endeavor	Intelligence for minor executive and leadership positions Excellent capacity for abstract, detailed, and highly skilled mechanical work Technical occupational level	Intelligence for routine and skilled mechanical work. Rarely capable of complicated abstract detailed work Skilled occupational level	Intelligence for some skilled routine work Semi-skilled and low-skilled occupational level	Intelligence for simple routine work only Requires unusual amount of supervision; unable to understand written directions Unskilled occupational level	Intelligence for very simple routine work only Lacks self-direction entirely Lowest unskilled occupational level	Intelligence for no social effort Sometimes possible for high-grade imbeciles to do very simple routine tasks under very careful supervision
	High professional occupational level	Professional occupational level						
Educational	Ability for superior (honor) record in university	Ability for an average college record	Ability for secondary school graduation and some college training	Ability for elementary school graduation and some secondary school training	Ability rarely sufficient for elementary school graduation	Ability limited so that individual usually drops out of elementary school before fifth grade	Ability limited so that individual is rarely capable of making any advancement in elementary school; may be unable to do manual work usually offered in kindergarten	Ability limited so that individual is rarely capable of making any advancement in elementary school; may be unable to do manual work usually offered in kindergarten
	Editor Lawyer Teacher (College) Engineer	Writer (Journalist) Physician Teacher (Elementary)	Stenographer Bookkeeper Nurse Office clerk Bank clerk	Engineman (Locomotive) Farrier Tel. operator Stock checker	Hospital attendant Mason Lumberman Watchman	Fisherman Laborer (Unskilled) Loader Lifter	Laborer (Simplest work)	No occupation

Levels

Diplomat Minister Salesman (Technical) Statistician Teacher (High School) Accountant Executive (Business)	Salesman (Insurance) Business man (Large Mer- chant and Banker) Chemist Private secretary Office man- ager Factory superin- tendent Draftsman Buyer Social worker Dentist Correspond- ent Minor exec- utive (Business)	Salesman (Wholesale) Business man (Small Mer- chant) Railroad clerk Teacher (Gymna- sium) (Elocution) (Domestic science) Traffic clerk Photographer Telegrapher Radio operator Conductor (R. R.) Musician (Band) Sign letterer Postal clerk Truckmaster Electrician Foreman (Construc- tion) Stock clerk Shipping clerk Express clerk Druggist Foreman (Factory) Graphotype operator Typist File clerk	Handyman (Gen. me- chanic) Policeman Auto assembler Engineer (Marine) Riveter (Hand) Tool and die maker Auto engine mechanic Laundryman Gunsmith Plumber Pipefitter Lathe hand (Production) Auto mechanic (General) Auto chauffeur Tailor Dressmaker	Brakeman (R. R.) Actor Butcher Fireman (Locomo- tive) Blacksmith (General) Shop mechanic (Railroad) Printer Carpenter (General) Motorman (Street car) Conductor (Street car) Baker Cook Mine drill runner Painter	Shoemaker Sailor Structural steel worker Canvas worker Leather worker Packer Fireman (Stationary) Porter Textile worker Sheet metal worker Laborer (Construc- tion) Domestic servant Laborer (Factory)
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¹ Douglas Fryer and E. J. Sparling, "Intelligence and Occupational Adjustment," *Occupations*, vol. 12 (June, 1934), pp. 55-63.

TABLE III. OCCUPATIONAL INTELLIGENCE LEVELS¹

Name of Occupation	Intelligence		Score Range of Middle 50%
	Group by Letter	Average Score	
Engineer (civil, mechanical)	A	161	110-183
Clergyman		152	124-185
Accountant	B	137	103-155
Physician		127	107-164
Teacher (public school)		122	97-148
Chemist		119	94-139
Draughtsman		114	84-139
Y.M.C.A. secretary	C plus	111	99-163
Dentist		110	80-128
Minor executive		109	81-137
Stenographer and typist		103	73-124
Bookkeeper		101	77-127
Nurse		99	78-126
Office clerk		96	74-121
Photographer		86	59-107
Telegrapher, radio operator		85	57-110
Band musician		82	57-108
Postal clerk		81	60-106
Electrician		81	57-109
Construction foreman		80	62-114
Stock clerk		80	56-105
Druggist		78	61-106
Factory foreman		77	59-107

son to protect school children from poor teachers. Finally, society can ill afford to lose the leadership of persons of superior capacity.

Tests of special aptitudes. A general scholastic aptitude test, or a so-called general intelligence test, makes it possible to express an individual's relative ability in a single score. In certain parts of the test, however, an individual may deviate significantly from his own general level as expressed by the summary score. For instance,

¹ From Douglas Fryer, "Occupational-Intelligence Standards," *School and Society*, vol. 16 (September 2, 1922), pp. 273-277.

TABLE III—*Continued*

<i>Name of Occupation</i>	<i>Intelligence</i>	<i>Average Score</i>	<i>Score Range of Middle 50%</i>
	<i>Group by Letter</i>		
Telephone operator	C	70	46-95
Stock checker		70	44-94
Policeman and detective		69	46-90
Auto assembler		68	51-97
Toolmaker		67	50-92
Auto engine mechanic		66	45-92
Plumber		66	44-88
Auto mechanic (general)		65	43-91
Tailor		65	42-89
Machinist (general)		63	40-89
Printer		60	36-93
General carpenter		60	40-84
Painter		59	38-81
Farmer		58	40-83
Bricklayer		58	37-82
Caterer		57	41-81
Sales clerk		52	38-96
Factory storekeeper		51	31-79
Mason	C minus	40	19-60
Structural steel worker		31	20-62
Textile worker		26	18-60
Construction laborer		21	13-47

he might make a relatively high score on language sections, and a correspondingly low score on the mathematics items. Another person might make approximately the same general score by virtue of high mathematical achievement and low linguistic performance. Thus the process of averaging performances on unlike functions tends to obscure rather than to reveal differences which are crucial for personal analysis.

In estimating aptitude for engineering training, for instance, one should consider part scores on sections measuring linguistic ability,

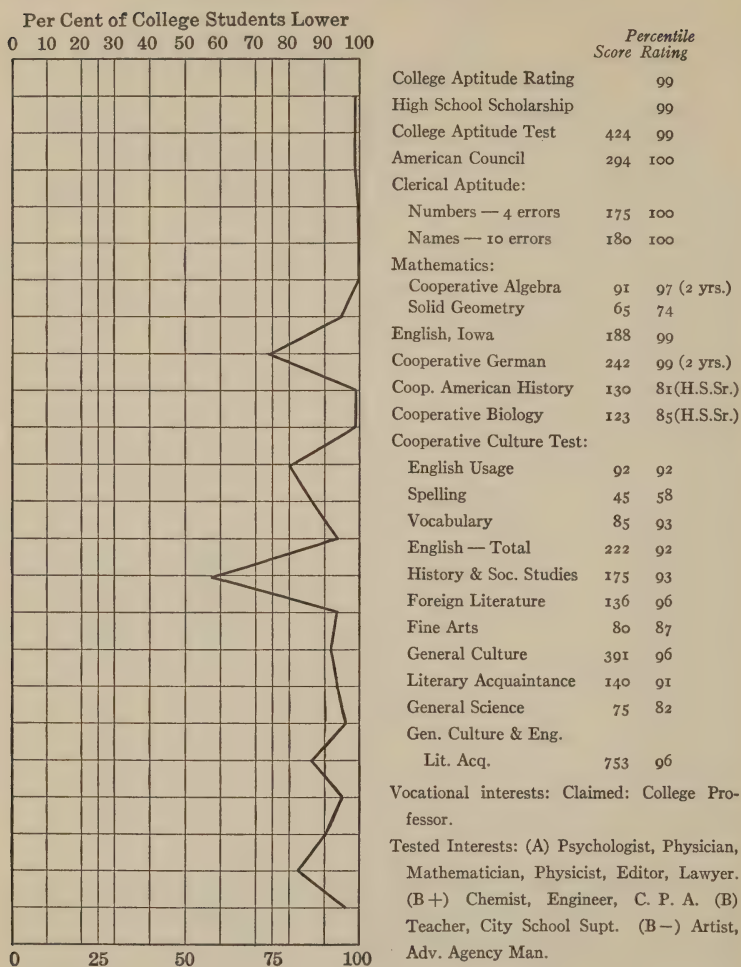


Fig. 19. PROFILE GRAPH OF STUDENT WITH HIGH ACADEMIC ABILITY ¹

mathematical ability, and perception of three-dimensional space relations, as well as general rank on such a test as a whole. Particularly is it important to measure separately characteristics which

¹ From E. G. Williamson, *Students and Occupations*, p. 38. Holt, 1937.

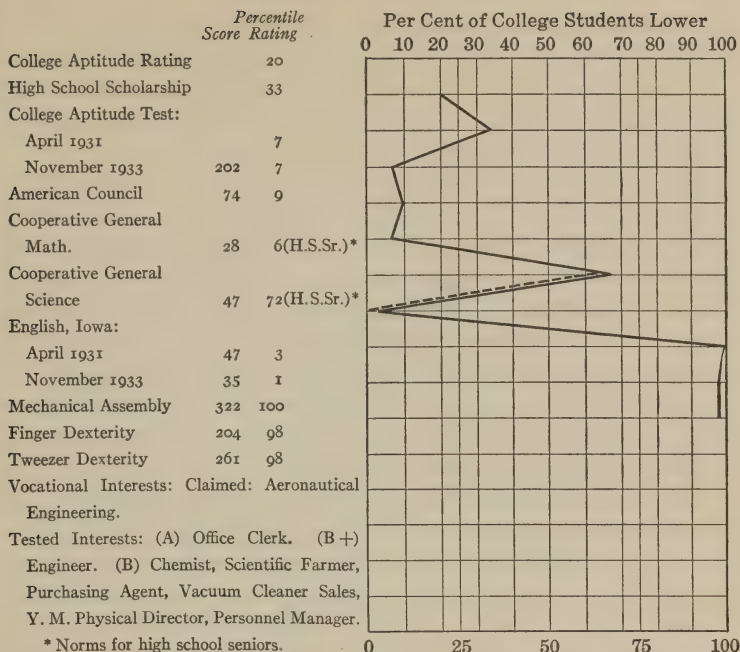


Fig. 20. PROFILE GRAPH OF STUDENT WITH LOW ACADEMIC ABILITY AND HIGH MECHANICAL APTITUDE ¹

are known to vary somewhat independently of one another. This need has stimulated the development of tests of special aptitudes and encouraged the use of individual profiles from which the pattern of the individual's several abilities may be inferred. Each person should secure a profile of his abilities. (See Figures 19 and 20.)

Traditionally, an aptitude test was defined as one which measures functions relatively uninfluenced by training. Since aptitude cannot be measured directly, however, it must be inferred from performance. Thus the distinction between native capacity and training breaks down in actual aptitude measurement. It is true, however, that certain aptitude tests, such as the Seashore tests of musical aptitude, measure functions which may increase during a

¹ *Ibid.*, p. 40.

given period mainly because of maturation or growth, but which do not respond greatly to special training. Functionally, the purpose of an aptitude test is prognosis, or prediction. Future performance depends, very frequently, both on underlying capacities and on specific achievement. Prognosis tests are therefore justified in combining measures of both. A mathematics aptitude test for college students includes, for example, a section on specific geometric information. Aptitude tests in medicine and nursing include many items which presuppose previous specific training on the part of the subjects. A definition which recognizes the true scope of aptitude tests has been phrased as follows: "A successful aptitude test reliably measures qualities essential in successful performance, by sampling previously acquired skills associated or antecedent to those qualities, but without introducing elements which can only be acquired from the proposed future study."

Neither a complete list nor a comprehensive description of special aptitude tests can be given here. Furthermore there is no space for a critical evaluation, which may be secured from other sources. The ones named will suggest the range and general nature of those available, however. A more complete list will be found in Bingham's recent book on aptitude testing. Only an expert in giving and interpreting tests should administer them. The student is referred to the department of psychology or to the personnel or guidance division of his own college or university for testing service.

Mechanical and manual aptitudes. The Minnesota Mechanical Aptitude Test, probably the best available, was described briefly on page 198. It is worthwhile to note that there is a difference between mechanical and manual aptitude. Bingham draws the distinction as follows:

To succeed in a semi-skilled occupation, the first requisite may be an aptitude for acquiring manual skill, for learning to do the operations rapidly and dextrously; but a skilled trade demands also a degree of problem-solving ability—of intelligence, mechanical, mathematical, and verbal—above the level of many an operative competently working at a repetitive manual occupation.¹

¹ W. V. Bingham, *Aptitudes and Aptitude Testing*, p. 132.

The examinations described in this paragraph are aids in the determination of manual aptitude. The O'Connor Finger Dexterity Test measures the skill and rapidity with which a subject can use his fingers in performing a simple manipulative task requiring fine eye-hand coördination. The O'Connor Tweezer Dexterity Test is designed to measure the skill and rapidity with which an individual is able to manipulate a small tool in working with objects requiring fine eye-hand coördination. O'Connor also devised the Wiggly Block Test in which the subject is required to reconstruct a block of wood which has been sawed into nine wavy pieces. The Minnesota Manual Dexterity Test measures the speed with which an individual picks up and places cylindrical blocks, all of the same size, in holes in a board. Other tests of manual dexterity are described in Bingham's manual.

Tests of motor control have been devised to measure steadiness, accuracy, coördination, and speed of movement. For sensory keenness, there are tests of visual acuity, color blindness, auditory acuity, pitch discrimination, and kinesthetic discrimination.

Clerical aptitude. The Minnesota Vocational Test for Clerical Workers measures the speed and accuracy with which the subject can detect similarities and differences in a series of paired numbers and names. The authors of this test report that a combination of the clerical aptitude test and an intelligence test gives better prediction of success in clerical training than either measure alone. They also found evidence that clerical aptitude is possessed to a considerable extent by successful executives, sales people, proof-readers, and other workers besides those in strictly clerical positions.¹

Aptitude in college subjects. The aptitude series of the Iowa Placement Examinations makes possible determination of aptitude in the following subjects at the college level: chemistry, English, foreign language, mathematics, and physics. These tests were prepared on the hypothesis that "it is better to infer aptitude for a particular subject through a test which combines those mental

¹ D. M. Andrew and D. G. Paterson, *Measured Characteristics of Clerical Workers*. University of Minnesota Press, 1934.

skills that are discovered to play a part in the subject than from a test which gives a more general measure of mental ability. A number of placement examinations lead to a profile of one's mental-educational skills, which in the case of adults is more intelligible and more significant than a simple measure, such as I.Q.; prediction of both general academic success and performance in specific subjects is more accurate with placement examinations than with general psychological tests." ¹

Professional aptitudes. All students who apply for admission to Class A medical schools are now required to take the Medical Aptitude Test devised by Moss. The colleges where students are taking the pre-medical curriculum administer this test annually, and the percentile rank of each student on the entire distribution of scores is reported back. Moss finds that "the aptitude scores give a somewhat better prediction of what the student can do in medical school than any other single one." At one university the Moss test scores correlated .636 with grades in the medical school for forty-five students. When the test scores and pre-medical grades were combined, the correlation was raised to .764, which is a very substantial relation. ²

Professional aptitude tests are also available in law, engineering, and teaching. For the most part, however, their predictive index is low. Scores on the Ferson and Stoddard Law Aptitude Examination have correlated with first year scholarship in the law school to the extent of about .54. Thurstone found relatively low correlations (average .33) between scores on his Vocational Guidance Test for Engineers and first-year engineering scholarship. ³ The American Council Psychological Examination, on the other hand, showed a correlation of .555 with first-year engineering grades in one institution. ⁴

¹ Bureau of Educational Research and Service, "Suggestions for Testing Programs at the College Level," p. 5. University of Iowa, Iowa City, Iowa.

² "Psychological Tests," *Review of Educational Research*, vol. 5 (June, 1935), pp. 224, 225.

³ H. E. Garrett and M. M. R. Schneck, *Psychological Tests, Methods, and Results*. Harper, 1933.

⁴ "Psychological Tests," *Review of Educational Research*, vol. 5 (June, 1935), p. 224.

Research workers attempting to find means of predicting scholarship in the several divisions of the University of Minnesota found a correlation of about .73 between the high school average and Iowa Mathematics Training Test scores combined, and first-year marks in the College of Engineering.¹

The Cox-Orleans Prognosis Test of Teaching Ability is difficult to evaluate because of the inadequacy of the criteria of teaching success ordinarily employed. The Stanford Educational Aptitudes Test purports to give a comparative measure of an individual's aptitude as a teacher, a research worker in education, and a school administrator. The manual declares that the test offers reliable estimates of the field or fields in education in which one may reasonably expect to do his best work. The scores are relatively independent of age, sex, professional training, and professional experience.

Scientific aptitude. Devised for the purpose of detecting aptitude for science and engineering (since the latter field demands basic science training), the Stanford Scientific Aptitude Test attempts to measure the following: experimental bent; clarity of definition; suspended versus snap judgment; reasoning; detecting inconsistencies; detecting fallacies; induction, deduction, and generalization; caution and thoroughness; discrimination of values in selecting and arranging experimental data; accuracy of interpretation; and accuracy of observation. Scores of science students on the test bear a substantial relation to ratings of the same students on aptitude for science made by their instructors. The discriminating power of the test is also indicated by the following hierarchy of average scores: unselected freshmen, 105; science freshmen, 113, non-science faculty, 118; the criterion group of science students, 134; science faculty, 153.

Aptitude for salesmanship. The test for Ability to Sell devised by Moss and others contains the following parts: judgment in selling situations, memory for names and faces, observation of behavior,

¹ These studies, directed by H. R. Douglass and others, will be published soon. They found combinations of measures which correlated above .7 for the Schools of Business Administration, Dentistry, and Nursing. These give substantial possibilities of predicting student success before entrance.

learning selling points in merchandise, following store directions, and selling problems. The average test score of twenty-five best sales persons in one large department store chain was 112, and the average of the poorest sales persons, 70.5.

Nursing aptitude. The Moss-Hunt Aptitude Test for Nursing has the following sections: scientific vocabulary, general information, understanding of printed material, visual memory, memory for content, comprehension and retention, and ability to understand and follow directions. Again, this test measures aptitude for training, and scores may be expected to predict scholastic success better than practical efficiency.

One who investigates aptitude examinations with the hope of discovering a decisive solution to the problem of vocational choice is certain of disappointment. Some of the correlations which have been found between aptitude scores and achievement in professional curricula were given in preceding paragraphs to show that, although objective examinations have a substantial value for prognosis, many other factors not measured at all or only imperfectly measured by the tests influence success. To determine one's aptitude scores, therefore, is but one of the steps in judging vocational fitness.

Achievement tests. Not only one's ability to learn, but what one has already learned, may affect the wisdom of entering upon a vocational or prevocational curriculum. High school and college grades contain so much more than sheer achievement—such as estimates of industry, attitude, coöperation, and even conformity—that scholarship can usually be more reliably measured by objective examinations. Standardized tests—that is, tests with uniform directions for administration and scoring, and norms based upon extensive samplings of students—are available in many high school and college subject-matter fields. In choosing standardized achievement tests, one should avoid the many which measure little more than factual material and results of rote memorization, and employ those which place an emphasis on understanding and application of facts and principles. Among the best objective tests available are those in the Iowa Academic Test series for high school subjects which are prepared by experts at the University of Iowa

for the state-wide testing program. The Coöperative Test Service of the American Council on Education provides several forms of examinations in a wide range of high school and college fields, in "general culture," and in contemporary affairs. Other valid tests can be suggested by test bureaus and the departments of education and psychology. Achievement tests and intelligence tests do not measure entirely different things. It is possible to secure a better measure of scholastic aptitude from a battery of good achievement tests than from a single group intelligence test.

Measurement of interests. Psychologists agree that interests should play a significant part in the choice of a vocation. Interest in a task heightens the personal satisfaction one secures from it, and creates zest for the work. A happy combination of interest and aptitude presages success in an occupation. Interests, even persistent and insistent ones, however, by no means guarantee corresponding abilities. The positive but rather low relation which obtains between interest and ability probably arises through the fact that we tend to become interested in situations in which we are successful. In other words, ability leads to interest more functionally than interest induces ability. Interest affects efficiency because it determines in part how vigorously aptitude is applied to the task. Interests aid in selecting a field of work; ability determines proficiency in the chosen occupation. Many expressed interests are misleading because they are based on fragmentary or illusory conceptions of the nature of occupations. A student who likes history may decide that he is interested in teaching history. But he may discover that his interest is in the subject and not in teaching, where the major concern is stimulating desirable growth of persons. The more objectively and comprehensively interests are identified, therefore, the better.

Vocational interest blank. One of the best ways to gauge vocational interests is to determine how nearly one's likes and dislikes coincide with those of the persons successfully engaged in certain occupations. Strong has utilized this procedure in the Vocational Interest Blank. This is an inventory of 420 items grouped in the following sections: (1) occupations, (2) amusements, (3) school subjects, (4)

activities, (5) peculiarities of people, (6) order of preference of activities, factors influencing work, famous persons, leadership positions, (7) comparison of interests among paired miscellaneous items, and (8) self-rating of present abilities and characteristics.

On the first five parts, the subject is to respond to each item with "like," "dislike," or "indifferent," by encircling L., I., or D. The following are examples:

Actor (not movie)	L	I	D
Advertiser	L	I	D
Architect	L	I	D
Army Officer	L	I	D
Repairing a clock	L	I	D
Making a radio set	L	I	D
Adjusting a carburetor	L	I	D
Repairing electrical wiring	L	I	D
Progressive people	L	I	D
Conservative people	L	I	D
Energetic people	L	I	D
Absent-minded people	L	I	D

Strong, in analyzing the interests of men in approximately thirty occupations, found that each occupational group had a characteristic set of likes and dislikes that differentiated it from other occupational groups. He has used these interest patterns in preparing scoring keys for the following groups of occupations for men:

- | | |
|------------------|----------------------------|
| I. Mathematician | Dentist |
| Physicist | Psychologist |
| Engineer | Architect |
| Chemist | Farmer |
| Physician | |
| II. a. Lawyer | b. Life insurance salesman |
| Journalist | Real estate salesman |
| Advertiser | |

III. a. Minister	b. Y.M.C.A. secretary
Teacher	Y.M.C.A. physical director
	Personnel manager
	School superintendent
IV. Purchasing agent	Accountant
Office worker	Vacuum cleaner salesman
V. Certified public accountant	

Strong has also prepared a women's interest inventory scored for the following occupations:

Author	Teacher of social sciences
Librarian	Teacher of mathematics and physical science
Artist	Lawyer
Physician	Y.W.C.A. secretary
Dentist	Nurse
Life insurance salesman	Stenographer-secretary
Social worker	General office worker
Teacher of English	Housewife
Teacher in general	

Numerical scores for each occupation for which scoring keys are available are expressed by the ratings A, B+, B, B-, and C. "A rating of A means that the man has the interests of that occupational group, a rating of C means he does not have the interests of the men in that occupation. Ratings of B+, B, and B- are intermediate; they mean he probably has the interests of the occupation, but we cannot be so sure of it as when he received an A rating."¹

Interest groupings. Strong found that occupational fields are not equally different from one another in interest patterns.² Thus, the interests of engineers and chemists are much alike, and those of life insurance and real estate men are nearly identical. The classification of occupations given above represents Strong's grouping according to the relatedness of interests. Other studies have shown that interest differences may be due to the operation of four

¹ E. K. Strong, Jr., "The Vocational Interest Test," *Occupations*, vol. 12 (April, 1934), pp. 49-56.

² *Ibid.*

basic factors; namely, interest in science, interest in language, interest in people, and interest in business. The community of interests is stressed by Strong in the following illustration:

If a boy likes mathematics, physics, and chemistry and dislikes English, he will most likely decide to be an engineer. On the other hand, if he dislikes the first three subjects and likes English, and if, in addition, he likes to talk, he will plan to be a lawyer. Decisions of this sort are made today because teachers and friends interpret such interests to mean engineering in the first case and law in the second.

As an actual fact, the first combination fits about equally well the occupations of farmer, engineer, chemist, dentist, architect, mathematician, physician, physicist, and psychologist, and the second combination is expressive of the early interests of those who later become not only lawyers, but also newspaper editors, authors, advertising men, and salesmen of life insurance and real estate.

Permanence of interests. Are interests permanent enough to use as aids in vocational choice? The evidence is clear that stability of interests increases with age. There are frequent shifts in adolescence—interest in becoming a movie actor or an airpilot or a railroad engineer may wane with a somewhat more realistic view of the occupational world. Strong found real changes from fifteen to thirty years of age, and evidence of great stability from twenty-five to fifty-five. Changes between twenty-five and thirty-five are greater than beyond that period.¹

Strong studied the constancy of the occupational choice of 223 men graduated from Stanford University in 1927 over a five-year period. One-half of them continued their occupational program for five years, one-fourth changed their plans radically, and one-fourth had selected an occupation, whereas five years before they had not made a choice. The occupational interest scores for the 223 persons in 1927 and 1932 showed a correlation of .84.²

It is probable that changes in interests are more apparent than real. Decided shifts from one group of occupations to another, such

¹ *Ibid.*

² E. K. Strong, Jr., "Predictive Value of the Vocational Interest Test," *Journal of Educational Psychology*, vol. 26 (May, 1935), pp. 331-349.

as from group I to group III of the classification on page 282, may be considered unlikely. If the occupational range is divided into many different jobs, one might expect considerable fluctuation from one to another within a related group. The fundamental preference pattern, however, would be maintained. By the time the student has reached the sophomore or junior level in college, he should expect that the broad categories of his occupational interest will remain stable. He may use them, therefore, with considerable confidence as one basis of vocational choice.

Personality tests. If special aptitudes are difficult to isolate and measure, personality and character factors are still more resistive to definition and objectification. Nevertheless, such characteristics as aggressiveness, dominance, submission, self-sufficiency, social ease, purposefulness, industriousness, tact, integrity, accuracy, and neatness are probably extremely important in choosing a vocation and succeeding in it. Unfortunately, however, these factors are extremely difficult to measure objectively, although some progress has been made in devising fairly reliable and valid means of identification. However, there is little available information as yet concerning their relation to vocational performance. Until such data are obtained, we must be extremely cautious in judging the occupational cruciality of measured personality factors.

Personality is itself difficult to define. It is not a force, or mental entity, or faculty. It is the person in interaction with his environment. For purposes of vocational guidance, personality may be thought of as the organization of behavior or tendencies to behavior revealed in the individual's social adjustment. Personality deals particularly with descriptions of the quality of behavior, not with mere activity itself. Qualities of behavior have to do with such characteristics as dependence, self-sufficiency, dominance, and submission.

Personality is not a mere sum but an organization of behavior trends. It is probable that people can be distinguished from one another in terms of the characteristic or habitual ways in which they tend to react to social situations. Thus, we frequently generalize the specific behavior qualities of an individual and call him domi-

nant or submissive, dependent or self-sufficient, as the case may be. This may be an oversimplification of the matter, however; such generalizations should not preclude specific variations from a dominant trend. For example, an individual may be dominant in one situation involving a certain group of persons and yet submissive in another group. College students who are relatively unassertive, submissive, and shy in the campus environment may exhibit quite opposite characteristics in the schoolroom when teaching. These variations in adjustment in different environments need to be considered in vocational planning.

Introversion-extroversion. It has proved fruitful to distinguish individuals in terms of tendencies toward introversion and extroversion. Unfortunately, these terms are often used without strict definition. They do not mean the same thing in different discussions. In general, however (see page 88), the introvert is one whose interests and energies are directed toward himself and his own experiences. The extrovert, on the other hand, directs his interests outward toward the social environment. The introvert is interested mainly in ideas and things; the extrovert, chiefly in persons and actions. Everyone normally possesses both characteristics in some degree, and behavior may shift from one to the other quality. At the extremes of the introversion-extroversion scale, however, are individuals who are more often than not interested in the world within, and those who are typically interested in the world without.

Extent and ease of social participation seem to be the criteria for many lists of introvert and extrovert characteristics. Thus the introvert supposedly limits acquaintances to a few persons, suspects others' motives, has strong self-reference, withdraws from social contacts, prefers to work alone, is shy with strangers, and is self-conscious. The extrovert, on the other hand, supposedly makes friends easily, trusts others, is unembarrassed in social situations and tends to take the lead in them, enjoys working with others, and is not very sensitive to criticism.

Other lists, however, deal with such matters as interest in ideas, liking for planning, creative behavior, independence in arriving at convictions, interest in reading and observation, and liking for

detail; or preference for action, likelihood of being influenced by others, ease of making decisions, and matter-of-fact acceptance of external conditions.

It has also been said that the emotions of the introvert are likely to be underdeveloped or repressed, while the extrovert expresses his emotions freely and is easily influenced by emotional stimuli. The frequent association of certain emotional characteristics with introversion may be responsible for the common but erroneous assumption that introversion is necessarily associated with neurotic behavior, and that the "normal" person must be extroverted.

Since the term "introversion" is used with reference to several aspects of behavior, such as ideational activity, social seclusiveness, and emotional inversion, it does not cover a series of homogeneous characteristics. An individual who is thoughtful and creative may be very well adjusted socially.

It is probable that different vocations require different relative amounts of the tendencies ordinarily grouped under introversion and extroversion, but the relationships as yet have not been clearly defined. It is difficult to interpret studies which have been made, for the scales devised to measure introversion-extroversion probably do not all sample the same behavior tendencies. A careful evaluation of the researches would include an author's definition of the terms, and an analysis of the measuring instruments used.

Several personality inventories have been devised so that more than one description of the individual may be secured by weighting the items in different ways. The Bernreuter Personality Inventory, for example, can be scored for four characteristics. The author describes them as follows:

1. *Neurotic tendency.* Persons scoring high on this scale tend to be emotionally unstable. Those scoring above the 98 percentile would probably benefit from psychiatric or medical advice. Those scoring low tend to be very well balanced emotionally.

2. *Self-sufficiency.* Persons scoring high on this scale prefer to be alone, rarely ask for sympathy or encouragement, and tend to ignore the advice of others. Those scoring low dislike solitude and often seek advice and encouragement.

3. *Introversion-Extroversion.* Persons scoring high on this scale tend to be introverted; that is, they are imaginative and tend to live within themselves. Scores above the 98 percentile bear the same significance as do similar scores on the neurotic tendency scale. Those scoring low are extroverted; that is, they rarely worry, seldom suffer emotional upsets, and rarely substitute daydreaming for action.

4. *Dominance-Submission.* Persons scoring high on this scale tend to dominate others in face-to-face situations. Those scoring low tend to be submissive.¹

Apparently, the four scores obtainable from the Bernreuter Inventory are not ascribable to as many independent factors. The fact that the neurotic tendency and introversion-extroversion scores are highly associated is evidence of some community between the two. It has been discovered that two fairly independent factors account for most of the four measures. They have been called self-confidence and sociability.²

It should be noted that such traits as "dominance-submission" are not first identified as components of personality, and then measured. What the authors of such scales as the Bernreuter do is to ascribe trait names to constellations of weighted items on their inventories. Thus these "traits," somewhat arbitrarily named, may be thought of as possessing a reality which they actually do not have.

The Bell Adjustment Inventory avoids the naming of traits by providing scoring keys for the following areas of adjustment:

1. *Home Adjustment.* Individuals scoring high tend to be unsatisfactorily adjusted to their home surroundings, while low scores indicate satisfactory home adjustment.

2. *Health Adjustment.* High scores indicate unsatisfactory, and low scores satisfactory, adjustment.

3. *Social Adjustment.* Individuals scoring high tend to be submissive and retiring in their social contacts. Individuals with low scores are aggressive in social contacts.

¹ R. G. Bernreuter, *Manual for the Personality Inventory*. Stanford University Press.

² J. C. Flanagan, *Factor Analysis in the Study of Personality*. Stanford University Press, 1935.

4. *Emotional Adjustment.* Individuals with high scores tend to be emotionally unstable, and those with low scores, emotionally stable.¹

Social adjustment. Several scales have been invented to measure aspects of social adjustment. One of the best known is the Allport Ascendance-Submission Scale, for which separate forms for men and women are available. The scale is composed of a series of situations or problems followed by from two to five alternate responses. The following are samples:

At church, a lecture, or entertainment, if you arrive after the program has commenced, and find that there are people standing, but also that there are front seats available which might be secured without "piggishness" or discourtesy, but with considerable conspicuousness, do you take the seats?

habitually..... occasionally..... never.....

Someone tries to push ahead of you in line. You have been waiting for some time and can't wait much longer. Suppose the intruder is the same sex as yourself, do you usually

remonstrate with the intruder.....

"look daggers" at the intruder or make clearly audible comments to your neighbor.....

decide not to wait and go away.....

do nothing.....

Allport makes the following suggestions in the manual for the use of A-S scores in vocational choice:

A young woman with a submissive score might not find herself at a disadvantage in such occupations as librarianship, nursing, secretarial or clerical work, editorial work, domestic science, dentistry, dress-designing, or millinery, pharmacy, teaching, statistics, research, or any form of literary or artistic activity. On the other hand, women with high scores, *if they have other requisite qualifications*, might safely consider salesmanship, social work, reportorial work, the management of clubs, tearooms or stores, law, medicine, personnel work, soliciting, or executive and administrative work. Men with submissive scores, *other traits being favorable*, might logically consider college teaching, architecture, art, farming, bookkeeping, banking, dentistry, editing, writing,

¹ H. M. Bell, *The Adjustment Inventory*. Stanford University Press.

music, secretaryship, mechanics, etc. Those who are ascendant in their scores would perhaps have a special advantage in salesmanship, executive work, factory management, law, politics, organizing, and kindred occupations.¹

The Washburne O.S.P.A. Inventory attempts to measure the following aspects of social adjustment:

1. *Purpose*—desire definitely directed toward a goal involving plan, evaluation, selection, and effort.
2. *Socialness*—a broad and lively interest in people.
3. *Sympathy*—sensitive, emphatic, and non-negative responsiveness with people.
4. *Poise*—emotional stability in social situations, and general sense of psychological intimacy and security with people.
5. *Impulse—judgment—self-control* in sense of being able to sacrifice immediate or easily attained satisfaction for a more remote or more difficult satisfaction which is recognized as greater.²

For the present, the scales, inventories, and ratings may be most safely used for making cautious interpretations of the individual's personal characteristics in relation to the nature of occupational demands. The student should always make these interpretations with the assistance of a trained psychologist or counselor. An analysis of the meaning of responses to individual items on the measuring devices may give much more insight into adjustment needs than a summary score. Evidence on the extent to which persons of college age can deliberately change their reactions to social situations is meager and inconclusive. The writer has a conviction, based more on faith than scientific evidence, that one can deliberately modify his reaction tendencies to social situations. To do so, he must acquire insight into the specific nature of his adjustments, and make constructive and feasible plans for developing new and successful modes of behavior. Psychologists and others who are sensitive to human motives and adjustments should give counsel, but the individual must take the principal responsibility

¹ G. W. and F. H. Allport, *The A-S Reaction Study*. Houghton Mifflin, 1928.

² In J. N. Washburne, "A Test of Social Adjustment," *Journal of Applied Psychology*, vol. 19 (April, 1935) pp. 125-144.

for reëducation. Where personality tendencies are normal but, at the same time, deep-seated, it will undoubtedly be more profitable to choose a vocation in conformity with them than to try to substitute others for them.

The vocational motives which this discussion has implicitly recognized are success in performance and personal satisfaction. Why has it slighted the desire to make a definite social contribution? We must recognize the importance of service in making occupational choice, but we must also understand that service results from work for which the individual is fitted by his aptitudes, interests, and personality traits. That person serves best who is successful in the performance of his tasks and whose work brings personal satisfaction.

Psychologist and counselor cannot make a career decision for any individual. They can assist the student in assembling the information about vocations and self which are essential in making a choice. But each person must arrive at his own conclusions. The procedures described in this chapter will not make a perfect diagnosis of vocational aptitude possible, but their intelligent use should result in a tremendous reduction in error over the fallible criteria which are so frequently employed.

QUESTIONS

1. Summarize the factors which are involved in wise vocational choice.
2. Explain why vocational choice is a process rather than an event.
3. How can you explain the fact that some studies show that students who have chosen their vocation do not make a higher general scholastic average than those who are still undecided?
4. Explain why estimates of vocational aptitude must be made on the basis of many characteristics.
5. Make a survey of campus opportunities for vocational tryout experiences.
6. What services should colleges and universities offer for vocational guidance?
7. Make an outline of the data which you think should be included on a cumulative personnel record to make it most useful in vocational guidance.

8. Why is it impossible to separate educational from vocational guidance?
9. Why are local institutional as well as "national" norms useful in vocational and educational guidance?
10. What are the limitations of various types of objective tests, scales, and inventories in individual guidance?
11. What is meant by a critical score?
12. Why are aptitude tests more than measures of native capacity?
13. Differentiate between mechanical and manual aptitudes.
14. With the coöperation of the psychological laboratory, clinical testing bureau, or other available agency, make a profile of your measured aptitudes, educational achievements, and personality characteristics.
15. With the assistance of a qualified counselor, make an interpretation of the occupational aptitudes revealed by the profile and other available personal information.
16. What is the likelihood that one will have measured interests in but one narrow occupation? That one will have measured aptitude for a single specific occupation?
17. What are the limitations of measured personality characteristics in occupational choice?
18. Who must take final responsibility for choosing a vocation?

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CHAPTER XII

PSYCHOLOGY AND MARRIAGE

PROBLEMS OF MARRIAGE

"Love is of all feelings the most egoistic; and, in consequence, it is, when crossed, the least generous."

This Nietzschean attitude assumes that love is self-centered and possessive. It would cast the husband in the rôle of master. In contrast, the modern attitude toward marriage stresses the necessity for the fullest development of the personalities of husband and wife. It emphasizes mutual enjoyment and good fellowship. This point of view is expressed in a book significantly titled *Personality and the Family*, which characterizes love in this fashion:

Love, when it develops beyond physical craving, begins to desire keenly the welfare of the loved person. The lover finds himself seeking, not primarily the fulfillment of his former personality, but the fulfillment of the personality of his new loved one, and their joint fulfillment through and in each other.¹

In the same vein, the well-adjusted marriage has been defined as one in which "the attitudes and actions of each of the partners produce an environment which is highly favorable to the proper functioning of the personality structures of each partner. . . ." ²

Emotional maturity and marriage. An individual who is still childishly dependent upon one or both parents is unlikely to make a success of marriage. The overprotected or overdominated child does not learn to exercise the initiative and independence of choice and action which adulthood requires. Thus he may never acquire the ability to compete satisfactorily in social and economic relation-

¹ H. and E. B. Hart, *Personality and the Family*, p. 54. Heath, 1935.

² E. W. Burgess and L. S. Cottrell, "The Prediction of Adjustment in Marriage," *American Sociological Review*, vol. 1 (October, 1936), pp. 737-751.

ships. Such an individual may be unable to break the parental attachment sufficiently to establish his own home. The dependence may be expressed by referring decisions to parents which husband and wife should make between themselves. Equally unfortunate is the married person who remains dependent upon father or mother for emotional satisfactions. To succeed in marriage, both parties must be able to transfer emotional security and gratification from interaction with parents to interaction between husband and wife.

Occasionally a young man or woman ready for adult responsibilities may be the unwilling victim of dominating or persistently solicitous elders. The assertive or possessive parent or parent-in-law can easily disrupt an otherwise promising marriage, and it would behoove the young couple to establish their independence quietly but firmly in such situations.

Development of love. The undue emotional attachments of parents and adolescents may be due to fixation, or arrested development of normal love impulses. The early stage of erotic behavior occurs in infancy. Then satisfaction is primarily a matter of rather undifferentiated or diffuse emotion stimulated by handling, contact with objects, and by gratification of basic organic needs. Much of this pleasant state of affairs arises through stimulation of erogenous zones, or sensitive skin areas where stimuli may excite erotic feelings. This is essentially a period of auto-erotism, or self-love as the Freudians have called it. In this connection the term "love" is used in a very broad and elemental sense.

Only gradually does the infant make the self-others discrimination. Even then other persons are interpreted primarily with respect to self—namely, as means of securing satisfying feelings. The individual begins as a highly self-centered being, and it is only through a long process of learning that he comes to adjust himself adequately to the reasonable wants and needs of others.

In the process of interaction between organism and environment, the infant may learn to stimulate by his own efforts the sense organs which are connected with satisfying emotions. Thumb-sucking thus partially satisfies the desire for the pleasurable feelings connected with eating; and masturbation, self-stimulation

of sexual organs, expresses a sexual fixation at the infantile level of self-satisfaction. While not harmful physiologically, the practice in late childhood or adolescence represents an inversion rather than a normal and natural turning of sex interest from self outward. Hence it is psychologically undesirable, particularly when accompanied, as it so often is, by scolding or punishment, or a sense of guilt, and it may lead to later difficulty in marital adjustment.

Failure to develop beyond the self-love stage leaves the individual excessively egocentric and insistent upon selfish pleasure. This is called narcissism. Only as they are like him, can such a person love others. His love for others is thus really love of self. The individual who enters marriage primarily for the satisfactions it will bring him may be suspected of acting basically on a very immature level of erotic development.

As the infant distinguishes others from self more definitely, he finds that parents, particularly the mother, are the source of his greatest satisfactions. The mother thus becomes the first "love object" of the child, and the normal relationships of the two constantly strengthen this attachment. A little later, the father may displace the mother as the principal or exclusive object of erotic identification of the daughter. The attachment of a girl for her father, however, is usually much less intense than that of a son for his mother. Therefore, if the girl can manage the hurdle of over-reliance on the mother, she may later transfer her love beyond the home more easily than the boy. These cross relationships may develop in part as an expression of greater natural attraction of the parent for the child of the opposite sex, and in part because of the way in which our mores shape the expression of affection. In any event, the fact that the child's love object usually becomes the parent of opposite sex is probably an aid to the ultimate development of normal heterosexual interests. This transference of sex and love interests from the family to other persons of opposite sex and of approximately the same age as the growing individual is an essential aspect of maturity.

It is when parents permit this natural attachment of children

to them to become too strong or to persist intensely over too long a period that danger arises. A sincere tendency to be overprotective, dominating, or solicitous may cause fixation at the child-parent level. A wife who has been dissatisfied with her husband may find compensation in excessive devotion to her son. A widowed parent may usurp the affections of a child or adolescent. The writer remembers a mother, whose husband was dead, who schemed successfully for a long time to keep her son from marriage. She often twitted him in public for his bachelorhood, but each time he became interested in a girl she managed subtly to break the attachment. Excessive child-parent affection may make it impossible for a young person to become erotically interested in anyone who does not resemble the favored parent. It may also dispose the individual to tolerate love and marriage only with a person much older. Finally, it may even preclude any form of satisfactory marital adjustment, which demands normal severing of childhood ties with the home.

Not to be on affectionate terms with his mother may be as serious for a man's later marital happiness as to be too intensely attached. Hamilton, who made a study of the marital adjustment of one hundred men and one hundred women, concluded that "too much or too little mother love produced husbands who were less happy in their marriages than the average of the research, and their wives were still less happy. . . . Mother's boys and mother-haters don't make happy husbands or good husbands."¹ The basis of this generalization was the evidence that 41 per cent of thirty-four men not on affectionate terms with their mothers were happy; 42 per cent of twelve men on very affectionate terms were happy, and 59 per cent of fifty-four men on moderately affectionate terms were happy. There were available for study eight wives of the twelve men on excessively affectionate terms with their mothers. Only two, or one-fourth of these wives, were happy.

The assumption that very strong parental attachment makes marital adjustment difficult was apparently not substantiated by

¹ G. V. Hamilton and K. MacGowan, *What Is Wrong with Marriage*. Boni, 1929.

a more recent study of one hundred couples in each of three groups: happily married, unhappily married, and divorced.¹ The happily married reported fewer conflicts with parents and more attachment than the unhappily married. The authors of the study suggested, however, that the basic child-parent relationships might be so obscured by rationalization and other disguises that they would not be revealed by casual questioning. The Hamilton study was conducted by means of an intensive psychiatric examination of each individual.

In late childhood there is a natural interest of the individual in others of the same sex, as evidenced in the formation of clubs and gangs. Friendships develop which in rare cases may become a fixation of a homosexual character. Homosexuality, a general term for sexual attraction between persons of the same sex, may take the form of "crushes" of relatively short duration, or it may appear as a perversion among adults resulting in many unfortunate social maladjustments.

It is possible that homosexual tendencies may be encouraged by strong attachments of mother and daughter which are not challenged, as they usually are, by the competition of the father for the daughter's love. This relationship sometimes seems to be a particularly difficult hurdle in the development of heterosexual tendencies.

Men or women who have not emerged from the so-called homosexual level of growth seldom make satisfactory husbands or wives. They cannot find normal pleasure in love relationships with their marriage partners, and this deficiency complicates other aspects of mutual adjustment.

The culmination of the developmental process appears when the individual's love-object becomes a person of the opposite sex and of approximately the same age. Heterosexuality is achieved without great difficulty if the child gradually weans himself from parents and finds pleasure in normal and fairly frequent contacts with

¹ L. M. Terman and P. Bittenwieser, "Personality Factors in Marital Compatibility," *Journal of Social Psychology*, vol. 6 (May, August, 1935), pp. 143-171, 267-289.

other young people of both sexes. These relationships are most constructive when they are natural and informal. With this background, and with the aid of desirable personal characteristics and continued opportunities for association with the opposite sex, normal love interests are likely to appear, and ultimately to lead to marriage.

Courtship. Courtship itself is one means of breaking parental love attachments and promoting heterosexual interests. It also provides the extremely important opportunity for two individuals to explore their interests, abilities, and attitudes. This understanding of each other may provide the basis for successful marital adjustment or reveal essential unfitness or incompatibility. The associations of a reasonably long courtship should test the depth of affection. Marriage based on sex attraction alone is likely to be unstable. Courtship should indicate the extent to which interaction between two personalities might progressively develop common interests, activities, ideals, and enjoyments which, with satisfactory sexual adjustment, seem necessary to make of marriage a permanently successful relationship.

There is a natural and commendable tendency for youth to idealize his companion during courtship. This should not blind either party, however, to a fairly realistic awareness of the other's characteristics, or the way in which the two personalities interact. This objectivity is necessary for a realization of the adjustments which marriage would almost certainly involve.

The magnification of sexual urges during courtship may blind one to the likelihood or unlikelihood of development of other psychological relationships necessary for continued happiness. "Petting" may lead to unfortunate disruption of friendship, or undesirable fixation of sexual satisfaction at a secondary level of expression. This may result in lack of desire for marriage and for experience of primary sexual relationships.

There are serious difficulties in undue postponement of marriage for engaged couples. Economic insecurity in recent years has kept many people from marrying. The length of professional education also imposes an unnatural restraint upon the expression of normal

sexual urges of lovers. These difficulties, combined with some relaxation of conventional prohibitions, have probably increased the amount of sexual satisfaction outside marriage. It is easy to be thoughtlessly dogmatic on the subject, but it is also easy to overestimate the advantages of expression or the disadvantages of restraint. It is more than probable that the deceptions and fears involved in extra-marital relationships, and the insecurity resulting from opposing the group mores, are psychologically more disturbing than continence and sublimation. It would very often be highly desirable for parents who can afford to do so to aid engaged couples to finance a home. Society may ultimately devise means for assisting young people to marry while completing professional or graduate training. In the meantime, it is wise for engaged couples to develop common interests and activities which minimize erotic stimulation and emphasize other satisfying results of companionship.

Groves,¹ in a textbook on marriage for college students, approves the following ways for a young man to test his love (the same criteria might be used by the girl):

1. A genuine interest in all the girl is and does because it is she and not some other.
2. Common interests, tastes, ideals, standards, and the absence of serious conflicts.
3. Greater happiness in her presence than any other.
4. Feeling of unrest and dissatisfaction in her absence.
5. Genuine comradeship, and willing give and take.
6. Eagerness to justify her opinion and judgment.
7. Feeling of pride in comparing her to any other.
8. A wealth of things to do together.

Adjustment in marriage. Sex and love are not synonymous. Love demands respect for the personality of the loved one; it is an altruistic rather than a selfish and individualistic emotion. Lasting love is based upon sexual attraction, but is characterized by aesthetic, intellectual, and social elaborations. However, although sexual compatibility is not in itself a sufficient foundation for happy marriage, it is an essential one. It is extremely difficult to determine

¹ E. R. Groves, *Marriage*, p. 139. Holt, 1933.

the frequency of the various real causes of marital maladjustment, separation, and divorce. Legal causes are insecure guides to basic psychological causes. There is considerable evidence, however, that unsuccessful and unsatisfying sexual relationships are among the most frequent sources of marital difficulties. These conflicts are, of course, often disguised, so that overt behavior masks underlying maladjustments. It is also true that sexual factors are very frequently associated with other causes for unsuccessful marriage; a complex conflict is ordinarily responsible for the breakdown.

Successful marriage not only necessitates sexual compatibility, but it is a continuous process of adjustment in personal relationships in other areas of interaction. Hart calls this deliberate attempt to maintain harmony and mutual enjoyment the process of creative accommodation.¹ It involves on the part of the husband an effort to facilitate the growth of his wife's personality by sharing experiences, and by developing new interests and encouraging the elaboration of old ones. The development of woman's personality may occur principally through the making of a home and the rearing of children. Additional interests and means of expression, however, are not only desirable but frequently essential for happiness. By providing labor-saving devices for the home, it should be possible to release the time and energy of the housewife for the development of cultural and recreational activities. She may advantageously engage in social or civic activities or in paid employment. Here the criterion of a successful marriage—the continuing development of the personalities of all members of the family—may aid in determining whether the wife should work. If all parties—husband, wife, and children—do not suffer, or are actually benefited by the arrangement, it seems justifiable. A woman frustrated in the use of her talents, cramped in the development of personality, and made slavish by routine can scarcely be expected to become a happy wife and mother.

The husband is responsible for aiding the wife to utilize the resources of her self, and she also has a reciprocal obligation. The wife should aid in occupational adjustment and progress where it

¹ H. and E. B. Hart, *op. cit.*, pp. 210-227.

is possible, and join her husband in the activities which he finds most enjoyable. How fortunate the pair whose cultural and intellectual interests have a high degree of commonality!

The causes of dissatisfaction or conflict in marriage which were found in Hamilton's study have been reclassified by another writer, and his tabulation is reproduced below.

The same writer ¹ has classified the causes of failure in marriage into three types of specific interferences and frustrations: (1) circumstantial or non-personality factors such as health, economic insufficiency, or interference of relatives; (2) personality defects in one or both mates which might cause failure in any marriage; and (3) differentials in personality characteristics, education, age, intelligence, culture, interests, attitudes, and the like which cause conflicts between partners. Although a community of interests, ideals, attitudes, and so on may be necessary for marital happiness, this does not mean that no essential differences can be tolerated. Disparities that result in interference with behavior patterns or motives of one of the partners are the ones that create serious conflicts.

Marital adjustment seldom takes care of itself. It should be a conscious and a continuous process of adaptation. Hart ² offers the following directions for dealing with actual or incipient interferences:

1. "Eliminate needless irritants and antagonizers." Even minor irritations may cause serious conflicts over a period of time.
2. "Discuss crucial problems frankly and openmindedly, but do not debate continually."
3. "Be just but do not demand justice."
4. "Formulate plans jointly." Marriage should be a genuine partnership.
5. "Invent solutions which will enlarge areas of agreement . . . if one or both are able to keep their purposes plastic, it is usually possible to find areas of agreement in wishes, and still wider areas of agreement in motives; unless these broad agreements exist, the

¹ J. K. Folsom, *The Family: Its Sociology and Social Psychiatry*, pp. 440-441. Wiley, 1934.

² H. and E. B. Hart, *op. cit.*, pp. 219-227.

TABLE IV. CAUSES OF DISSATISFACTION IN MARRIAGE ¹

<i>Classification</i>	<i>Number of times mentioned</i>
Non-personality (circumstantial) factors.....	64
Occupational.....	9
Economic situation (no blame).....	15
Health.....	16
Age.....	1
Children.....	2
Lack of children.....	7
Difficulties caused by their respective families...	14
Personality defects.....	99
Fundamental personality defects of spouse.....	33
Defects in self.....	16
Alcoholism of spouse.....	3
Other objectionable habits of spouse.....	12
Conditions of married life found irksome.....	29
Inadequacy of spouse as parent, or unwillingness to have children.....	6
Personality or culture differentials.....	39
Spouse's insufficiencies of intellectual, vocational, or social capacity (presumably not a defect if properly mated).....	14
Cultural or educational disparity or defect.....	10
Lack of common interests.....	15
Specific marital frustrations.....	249
Unsatisfactory sex life.....	85
Jealousy, interest of spouse in outsiders of oppo- site sex.....	21
Lack of desired kind or amount of affection.....	16
Attitudes of spouse toward self.....	36
Disagreements, lack of sympathy, and other fam- ily interaction.....	42
Temperamental differences.....	29
Unsatisfactory economic or social life blamed upon other.....	20

¹ J. K. Folsom, *op. cit.*, p. 442.

matching of the two personalities has been hopelessly imperfect."

6. "Surrender non-essentials."

7. "Be a good sport."

Predicting marital success. If relationships can be discovered between personality characteristics and "background items" of prospective husbands and wives and their marital adjustment, the basis may be laid for predicting success in marriage. Burgess and Cottrell¹ studied the relationships of easily obtainable data, rather than those which would "require the subtle powers of the psychologist or psychiatrist to detect," to happiness in marriage. Their subjects were 526 couples comprising a relatively homogeneous, middle-class, native white urban group of men and women. The individuals rated the happiness of their marriage on a five-point scale. This rating, when checked against certain other criteria, seemed to be fairly reliable and valid. The procedure was to determine what data secured from a questionnaire submitted to the subjects were significantly associated with degree of adjustment. By assigning a numerical weighting to the replies to twenty questions, an adjustment score was obtained which discriminated between divorced or separated persons and those whose marriages had not been broken, and between those who had and had not considered separation or divorce.

The relationships of such factors as age, health, education, occupation, earnings, religious affiliation and activity, friendships, length of courtship, happiness of parents' marriage, and the like, to the adjustment score were then determined. This procedure revealed such results as the following: High educational level at the time of marriage was associated, in general, with a high adjustment score. The wife's educational attainment seemed to be more influential on chance for a high adjustment score than the husband's. However, wide differences in educational achievement were associated with low adjustment scores. Persons who were inclined to join organized social groups had better chances for marital happiness than those who lacked such interests. This item was more discriminating for husbands than for wives.

¹ E. W. Burgess and L. S. Cottrell, *op. cit.*

The study of personality factors in marital compatibility conducted by Terman and Bittenwieser ¹ is one of the most important of those made to date. They used one hundred happily married, one hundred unhappily married, and one hundred divorced couples as subjects. The happy and unhappy groups were differentiated on a happiness rating which was derived from the following items of the questionnaire submitted to the subjects:

1. Extent to which husband and wife engage in outside interests together.
2. Agreement of partners on the following matters:
 - a. Handling family finances
 - b. Recreation
 - c. Religion
 - d. Demonstration of affection
 - e. Friends
 - f. Intimate relations
 - g. Caring for children
 - h. Table manners
 - i. Matters of conventionality
 - j. Philosophy of life
 - k. Ways of dealing with in-laws
3. Means of settling disagreements
4. Regret over having married
5. Desire to marry same person if life were to be lived over
6. Contemplation of divorce or separation
7. Appraisal of marital happiness on a five-point scale

The significance of personal characteristics for marital compatibility was determined by discovering the degree of association between them and the happiness score. Some of the most interesting results follow:

1. Age at marriage had little influence on marital happiness. This finding differs from that of Hamilton, who found that his subjects' marital happiness increased as they married later in life up to thirty-five, after which it receded slightly. The difference

¹ L. M. Terman and P. Bittenwieser, *op. cit.*

may be due to discrepancies in the composition of the groups studied.

2. There was no correlation between age differences of husband and wife and adjustment. This again is contrary to Hamilton's findings, which indicated that men were happiest when they were one to three years older than their wives, and that wives were happiest when they were the same age as their husbands. The effect of age differences on happiness is probably related to other factors which determine the incidence of adjustment problems and reactions to them.

3. The presence of children may lessen the chances of divorce, but seems to have little relation to marital happiness. Husbands and wives should agree, however, on wanting or not wanting children.

4. Outside interests in common are significantly related to success in marriage.

5. The offspring of happily married parents have greater chances of successful marriage.

6. Only two of the correlations between responses on the Bernreuter Personality Inventory and the Strong Vocational Interest Test were high enough to be of much use in predicting marital happiness; these were a positive relationship between the husband's teacher interest and his wife's happiness, and a negative association between the husband's neurotic tendency (or introversion as measured by this inventory) and his own happiness.

7. An exploration of the differences between the scores of husbands and wives showed some relationships with marital happiness. Agreement on the following items, among others, from the Bernreuter Inventory seemed to favor happiness, although the correlations were often small:

a. Are you easily discouraged when opinions of others differ from your own?

b. Do you want someone with you when you receive bad news?

c. Do you usually try to avoid arguments? (This was the most significant item.)

d. Do you especially like to have attention from acquaintances when you are ill?

e. Are you able to play your best in a game or contest against an opponent who is greatly superior to you?

f. Do you lack self-confidence?

g. Do you prefer a play to a dance?

h. Do you usually work better when you are praised?

i. Are you usually considered to be indifferent to the opposite sex?

On the other hand, agreement on the following Bernreuter items is correlated with unhappy marriage:

a. Have you ever crossed the street to avoid meeting some person?

b. Are you much affected by the praise or blame of many people?

c. Do you ever rewrite your letters before mailing them?

d. Do your feelings alternate between happiness and sadness without apparent reason?

e. Does discipline make you discontented?

CHILDREN AND PARENTS

Children are persons. Psychological care of the child requires the parent to treat him as a person in his own right. This calls for a sincere respect for the integrity of the child's personality at all times. The young need the same consciousness of selfhood that is necessary for adequate adult adjustment. To disparage their often naïve but nevertheless sincere offerings for the general family welfare, to ridicule their behavior, to curb all initiative and freedom, or to make little puppets of them, may seriously defeat children's striving for person-status. Unnecessarily severe punishment may batter the ego until it cowers submissively or attacks resentfully. Unreasonable demands for obedience may establish parental authority but disfigure the child's personality.

Some parents still make chore boys or handmaidens of their children, but exploitation today is more often psychological. By multifarious devices parents may violate the individuality of their offspring. For example, "the parent reacting against his own failures, or seeking through the child vicariously to achieve his one-time ambitions, or merely using the child to add to his vanity, struggles to force the child life into a predetermined mold and when he fails insists that it is the child and not himself that is at fault."¹

¹ E. R. Groves, *op. cit.*, p. 467.

Parents should understand that their children have the same basic needs as those which they themselves must satisfy. Children need security and social recognition, thrive with accomplishment, and suffer under constant failure and inferiority. They attain competence by learning how to solve problems of living effectively and realistically. They grow in power by performing important tasks for which they receive group approval, and acquire social attitudes and responsibilities by participating in family activities.

Children feel insecure when they find they are unwanted, or that they are nuisances to be tolerated. Parents are frequently too selfish to accept happily the restrictions which successful parenthood entails. Children need the warmth of care and affection, and the consciousness of belonging. It is just as possible to starve the child for love as it is to stifle him by overaffection. The feeling of being unwanted may kindle the fear in the child that his father and mother are not his own but foster parents.

Separation and divorce often leave the child insecure. These disruptions often cause embarrassment among other children and adults. Not infrequently they splinter the child's personality because they divide loyalties and create conflicts. The strife and emotional tension between parents which frequently precede separation are often more disintegrating emotionally to the child than the actual disruption of the home. Many children make a satisfactory adjustment to family disintegration, but psychologists have found a higher proportion of personality problems among children and adolescents in broken homes than in normal families.¹

Fundamental personality patterns take form to a considerable degree in early childhood. Parents often ascribe problem behavior to innate propensities when it actually arises out of the adjustments children make to situations within the home. For example, the child may lie to escape harsh punishment, or to compensate for inferiority. Habitual temper tantrums are devices which the child learns in order to control his parents or to get his own way. Complaining parents often suggest illness to the child as a means of

¹ White House Conference on Child Health and Protection, *The Adolescent in the Family*. Appleton-Century, 1934.

escaping conflicts. Elders may also provide models for the acquisition of habits of dishonesty or unfairness. The ways in which parents analyze and solve the many problems which arise in family life may be reflected in the child's techniques for dealing with reality. The socialization of the self-centered infant proceeds fundamentally through the home. Sharing duties and responsibilities consistent with developmental level, contributing to the needs of others, and practice in group work and play are the means of acquiring constructive social attitudes.

The relationship between pupil adjustment and intra-family relationships for seven hundred junior-senior high school children of a suburban community near New York City revealed a large number of factors which tended to differentiate poorly from well adjusted pupils.¹ Good adjustment in the case of ninth to twelfth grade pupils was found to be associated with such conditions as the following:

Pupil's mother supervises the important things he does.

Pupil's point of view is generally accepted by parents.

Father and mother always or usually carry out threatened punishments.

Father's and mother's remarks when correcting pupil are helpful and kind.

Father usually keeps promises made to pupil.

Father and mother never nag pupil.

Father and mother always take time to listen to pupil's problems.

Mother always considers pupil's point of view.

Pupil reports home life happy.

Parents usually coöperate in management of the home.

Father and mother are always kind to each other.

Father and mother never quarrel and seldom have disputes.

For the most part, items opposite to those above were indicative of poor adjustment. Contrary to what one would expect, the administration of severe punishment tended to be associated with good adjustment.

¹ T. R. Myers, *Intra-Family Relationships and Pupil Adjustment*. Teachers College, Columbia University, 1935.

A study of the influence of home conditions on personality adjustment of junior high school pupils was made under the auspices of the White House Conference on Child Health and Protection. The subjects were white urban children of native fathers, 941 boys and 1016 girls. The investigation revealed that "lack of confidential and sympathetic relation with parents reduces by one-half the adolescent child's chance for wholesome social and emotional attitudes."¹ Crucial factors of development proved to be subtle facts of intra-family relationships such as affection, confiding in parents, mutual trust, loyalty to parents, and control by some means other than punishment. The patterning of the child's personality through home relationships is inevitable. Wholesome development, the study concluded, depends upon favorable answers to the following questions:

Does the child have affection and reassurance in the family?

Has he secured a satisfying rôle in family life?

Is family life stimulating and enriching?

Is control in the home based upon full and equal participation in the family council and in familial objectives or does it rest upon formal and arbitrary discipline?²

The point of view of this chapter is succinctly represented in the final question of the Conference report:

Do the relations of husband and wife, of parents and children, and of children with each other promote or impede the personality development of the members of the family?

QUESTIONS

1. How may parents guide the development of self-dependent habits in children?
2. Is the parent or child ordinarily responsible for excessive attachment between the two? Explain.
3. Explain the reasons for laws requiring physical examination before marriage.
4. What is the danger of a narrow range of acquaintances from whom to choose a mate?

¹ *Op. cit.*, p. 272.

² *Ibid.*, pp. 300, 301.

5. Would it be desirable to take steps to reduce the cost of dating and courtship on college campuses?
6. Why might a great difference in age complicate marital adjustment?
7. Explain why understanding of the psychology of sex, as well as the physiology of sex, is necessary for success in marriage.
8. Explain the significance of this statement: "Sex desire is a human, not a masculine, endowment."
9. Why is a marriage based on sex attraction alone very likely to fail?
10. Give instances of adjustment in marriage which have come to your attention.
11. What personality defects in one or both mates might cause failure in any marriage?
12. Explain why personality relationship factors are more often associated with success or failure in marriage than specific personality characteristics of husband or wife.
13. Why is solution of conflicts through discussion and mutual compromise preferable to repression in marital adjustment?
14. How should the management of family finances be arranged?
15. Summarize intra-family relationships which are conducive to the normal development of children's personalities.
16. Why would the sexual freedom among adolescents characteristic of some primitive societies be unwise in our civilization?

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IV. LEARNING AND STUDY

CHAPTER XIII

THE GENERAL NATURE OF LEARNING

The appropriate response. One very important characteristic of all higher life forms is their capacity to respond in ways in which they have never responded before. A dog learns to come when he is called; a child learns to speak and read; an adult learns to drive a car, invest his money, or make himself more proficient in his life work. Parts of the environment—the whistle, the printed page, the driving mechanism of the car—come to be responded to, and the response is a new coördination. The new response is in one way or another appropriate to the situation, in that it is satisfying to the individual and in harmony with his desires and needs. The new response may of course be only partially satisfying, especially if it is not completely mastered; and the process of mastering it, too, may be far from efficient. But in any case, learning is essentially one process whatever it is that is learned, though there are many varying conditions.

PLASTICITY

Mechanical reaction. The capacity to learn involves a flexibility or plasticity in the organism such as is not found in non-living things. A piece of iron will always be drawn to a magnet and never be indifferent to it or repelled by it. A pool refracts the light, or sends out its circle of ripples when a stone is thrown into it, always in the same way. It never tries a different way, never learns better and never forgets. Similarly, chemical reactions in the laboratory or elsewhere are always the same. Any change in their action as time goes on involves some recognizable change in the materials themselves. Iron filings cannot be “taught” to move toward a piece of wood, nor a pool to maintain a smooth surface when a

stone is thrown into it. Material or mechanical reactions are characterized by their regularity or uniformity.

Tropism. Some activities of certain forms of living matter show a similar uniformity. Root tips regularly bend toward the ground in whatever position the seed happens to be placed. Sunflowers and other kinds of vegetation incline toward the sun; moths invariably seek the light though it may mean their immediate destruction. Certain simpler life forms always congregate at the lighter end of a tank while others collect at the dark end. Similarly, larger animals are wont to sun themselves, and people who do this report a considerable satisfaction in the process. It cannot safely be said that the sunflowers, the root tips, the moths, and the animalculi also enjoy themselves. But there is in their case, and perhaps also in man, a mechanical reaction taking place which necessarily results in just this form of behavior and no other. In the case of a true tropism the behavior cannot be varied: when the stimulus of a certain sort is presented, the organism must respond as it does respond, and in no other way.

Reflex. Some of the responses of human beings have these same characteristics of mechanical regularity and unmodifiability. Perhaps the pupillary or iris reflex is the best example. Light regularly causes the iris to draw back, making the pupil of the eye appear larger, and darkness produces the opposite effect. Other reflexes, the patellar (or knee jerk), the winking reflex, the salivary reflex, and the rest, are similar except that it is possible to modify their action somewhat, in certain respects.

Instinct. Some of the unlearned behavior of the lower animals is almost as regular and unmodifiable as mechanical reactions, or as tropisms or reflexes. The migratory flights of birds or their feeding or nest-building proclivities, though they require much more complicated adaptations to environmental changes than the simpler responses, recur with surprising regularity. The web of the spider, the wasp's nest, the ant mound, and the comb of the honeybee are constructed with an amazing precision which has been the wonder of men throughout the ages.

The mechanical nature of such instinctive activity is illustrated

by the responses of many of the subhuman species. The dragon fly lays her eggs on shiny surfaces—on water where they will develop, or sometimes on a tar roof where they will not. A colony of ants established a trail between their nest and some honey along a narrow bridge of paper strips laid end to end. One of these strips was then turned around so that the ends exchanged places, with the result that the ants were stopped on both sides. A kind of wasp stings spiders by pouncing on them from behind, curling her abdomen under the body and stinging them in the “chest,” close to the vital ganglionic mass; the spiders sometimes die, sometimes are paralyzed, and sometimes get well, according to the accuracy of the thrust. Chicks, on escaping from the shell, peck at corn—or any other bright object; but some which were kept in the dark and fed from a medicine dropper for fourteen days after hatching would not peck and could be taught to only with the utmost difficulty.

Thus even these cases of instinctive behavior show a certain degree of flexibility. Indeed, in practically all forms of life some plasticity is found, which means that variations in their behavior with respect to certain elements of the environment occur, and new ones may come to be adopted.

Subhuman learning. Modifications of behavior can most easily be made in situations in which the animal concerned seems to have no such regular pattern of response available. The most frequently used form of laboratory apparatus for this purpose is the maze. Invented by E. L. Thorndike in his work with chicks in the last years of the past century, the maze has since assumed many forms. Essentially it is a series of intersecting pathways, one of which, if correctly followed, leads the experimental animal to food. Learning consists in eliminating excursions into blind alleys and cutting down the time required to go from the starting point to the food box. Simple mazes have been constructed for snails, turtles, ants, and chicks, and more complex ones for white rats, the favorite laboratory animal; large inclosures have been fenced off for studying the learning of sheep and horses. Water mazes compel the animal to swim his course. Pencil mazes for human subjects con-

sist of grooves which they follow, while blindfolded, with the point of a pencil.

Multiple response. The essential characteristic for an organism to possess, if learning is to take place, is plasticity, which implies modification of the structure of the organism.

But first it must be able to respond to the same situation in different ways. Such a condition, which is called multiple response, can be diagramed as in Figure 21.



Fig. 21

Here S is the stimulus situation. The two primary possibilities are: to move toward it, and to move away from it. These are called responses of approach and avoidance, and are in the repertoire of such simple organisms as the single-celled amoeba, paramecium, and stentor. But the more complex forms of life are capable of playing many variations on these basic themes.

Suppose a small child is confined in a baby pen on the parlor floor, and in it with him is a pillow. He can move toward it or away from it, but he can also walk on it, sit on it, put his head on it, or put it on his head, pick it up, throw it outside the pen and yell for it! It is impossible to catalogue the number of ways in which an adult can respond to the many complex aspects of his environment.

One reason why a person may seem to respond in different ways to the same situation is that he is actually responding to different parts of the total environment. Thus the child is responding to the softness of the pillow when he sits on it, to its qualities as a missile when he throws it, and so on. In the case of a more complicated stimulus object, like an automobile, an individual may respond in one way to its color, in another way to its style, in a third to its price, and in endless ways to its several mechanical parts.

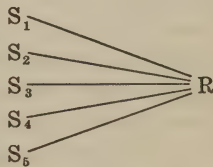


Fig. 22

Multiple causation. But different stimuli can likewise produce the same kind of response. One may hurl a pillow, a brick, or a

baseball; or a child may show the fear of a number of different objects. The multiple causation of such a response can be diagrammed as in Figure 22.

The process of learning consists not only of developing new coördinations which the learner could not make before, like swimming, but also of attaching old responses to new and different stimulus situations which did not previously call them forth. For example, a child learns to say "dog," which he could not do before, when he sees a certain animal; but having learned this response, he also learns to say "dog" when he sees the letters *d-o-g*.

MOTIVATION

Basic drives. Before considering the process of learning in more detail, it may be well to look further into the implications of a statement made earlier, to the effect that the new response is in one way or another appropriate to the situation in that it is satisfying to the individual and in harmony with his desires and needs. In a preceding chapter it was pointed out that organisms are by nature dynamic; that is, they are energy-producing mechanisms, like a dynamo, or a steam engine, and not inert like a stone or a lump of clay. This energy is in part expended in keeping the vital functions in operation, and in part in moving the organism about.

It is a well-known fact that under certain conditions objects in the environment stimulate an organism to particular types of activity with almost the regularity of a mechanical reaction. Such stimuli are said to rouse the basic drives such as hunger, thirst, air hunger, sex, and the like. To be effective, however, the stimuli must occur in such a way and at such a time that the internal condition of the organism is in readiness to respond to them. The hunger drive, for example, which is most frequently used in animal maze experiments, is obviously inoperative if the animal has recently been well fed. On the other hand, if an animal is hungry, organic stimulation within the organism causes general activity and food-seeking responses. The food does not have to be actually present for the animal to reveal the operation of the drive. What-

ever the animal, whether rat or primate, the period of food-seeking is the time when learning takes place.

Incentives. The human subject must also be motivated if he is to learn, but food only occasionally serves as an incentive to learning. A child may perhaps be told that he cannot have any dinner unless he uses his fork properly, which may result in considerable improvement in its manipulation. But college students can hardly be deprived of their dinners until they learn their lessons, effective as such a procedure might prove to be. Similarly, the other basic drives operating through deprivation, though they may actually facilitate learning in the so-called school of hard knocks, are socially unacceptable and fortunately unnecessary in the ordinary affairs of life.

Incentives for human learning are conveniently divided into extrinsic and intrinsic. Extrinsic incentives are those which are in some way foreign to the learning situation, like prizes, good marks, and favorable recognition. Money, the great incentive, is symbolic, in that it represents other rewards which may be desired, and it may, of course, operate like the food box at the end of the maze, over a long period of preparatory activity. Apparently extrinsic motivation is about as effective in learning as any other kind, and in one form or another quite necessary.

Intrinsic motivation, however, is regarded as more ideal in that the incentive lies within the task itself. Learning is its own reward. Men work at hobbies, scientists in their laboratories, artists in their studios, primarily because such work is what gives them the most satisfaction in life. They would rather be doing that than anything else. Children do the same kind of thing, avidly picking up all kinds of information and misinformation because the process is satisfying in itself. It is fortunate that this is so, for it would be difficult indeed to arrange an extrinsic reward for each new word learned, each skill acquired, each concept or generalization formulated.

Complication of motives. In the case of human learning, there is rarely if ever a single, isolated incentive operating. The individual is rather in the midst of a sea of conflicting motives, which are so

numerous and so complex that he himself is quite unable to determine by which ones his action is actually directed.

Suppose, for example, a person is reading a page of history or practicing a stroke in golf and is asked why he is thus spending his time. He might reply that he enjoyed it, or wanted to "get the hang of the thing," or that somebody wants him to, or that it will aid him in getting a promotion—and any or all of these may be true. He may be said to be in a field of forces which operate in such a way as to produce one or another kind of behavior, but which must be arranged in a particular way if learning is to be the outcome.

Obstruction. Learning to make either new coördinations or familiar responses to substitute stimuli implies that the individual is somehow blocked or thwarted, that the basic drive or the motivated activity meets with some obstruction. With no obstruction the coördination runs its automatic course as it has done before, and no learning takes place. When, however, the path to the food box is crossed by blind alleys, when the ball is missed or goes wild, when the illiterate find doors closed to them that are opened to the literate—at such times as these the occasion for learning arises.

An obstruction may induce other than learning responses—neuroses, for example. And minor, less important motives may be obstructed without any noticeable consequences. But if the obstruction interferes with the operation of what may be called the principal motive, be it food-getting as in most animal experiments, or the satisfaction of basic individual or social needs, adjustment can follow only if a different response or set of responses appears. Or, stating it the other way around, when learning takes place, there has been some obstruction to the principal motive or motives.

Set. When the obstruction is encountered, the organism evidences an increased activity. Laboratory animals as well as human beings "rise to the occasion." They may run about, may seem to become more alert and attentive and more determined, and they may put forth more muscular effort than the occasion demands. Their activity is all directed toward removing or circumventing

the obstruction, and only the rise of a different principal motive will occasion any change in the direction of their activity.

A cat or a squirrel appearing in the maze would probably effect such a change in the behavior of rats, the sudden recollection of an important engagement in the case of one working on the perfecting of his golf stroke, or a fire in the building where a student is "cramming" for an examination.

The operation of a set or determining tendency is one of the most elusive phenomena in the realm of psychology, yet one of the most familiar. It cannot be introspected adequately, for some of its elements are apparently not conscious; and it is hard to observe and report accurately because it is subject to rapid shifts, and the interpretation of the total behavior is subject to error. Many clear cases, however, have been observed by everyone. A dog chasing a rabbit makes a good illustration; a puppy, however, will be led off in several directions one after another by passing scents and noises. A mental set is operating when an individual is looking for a lost article, solving a problem, trying to find the right word, preparing a speech, and so on. Learning may take place during the period of hyperactivity in which the set operates to overcome or circumvent the obstruction to the principal motive in the field of forces.

ACQUISITION

Attention as selection. The term "attention" is applied to a condition of the organism in which its set or activity is directed toward one part or aspect of the environment. It differs from set in that the latter is a continuing tendency and may involve attending to many different things successively. Attention usually involves a directing of the eyes, ears, or nostrils, or perhaps all three, in such a way that the sensory stimulation is obtained with the greatest possible clarity.

But an individual may attend involuntarily to some things, such as intense stimuli—loud noises, bright lights, strong odors—and to change or movement, without being able to help himself. On the other hand attention may be voluntary, at least for human

beings, when there are distractions, unpleasant conditions, or conflicting stimuli, as when one attends to such things as dull pages and dry speeches. Similarly, one may attend passively to whatever the environment presents, letting come what may; or one can attend actively, selecting from the environment what is in accord with some particular mental set.

In any case, attention is selective in that separate environmental segments or relationships are responded to. The untaught learner may attend to the wrong things when learning, and it is thus a part of the function of the instructor or coach to point out the significant elements. Such phrases as "Keep your eye on the ball," "You didn't notice the decimal point," "What is the verb ending?" or "What were the conditions which forced the abdication?" are perhaps illustrative of instructional guidance in focusing attention.

Cues. If the learner may attend to the wrong things, it is implied that there are right things to which to attend, and further that the teacher or coach knows what they are. What is it that makes an aspect of the total situation the right or the wrong thing to attend to?

Clearly some parts of the environment are more significant than others as possible indicators of action which is appropriate to a certain line of activity. For the golfer, the movement of the leaves on a nearby tree need be of no particular concern, though for the hunter they may be. A child learns to tell a Christmas parcel by the way in which it is done up; he learns to distinguish a cat from a dog perhaps by its size or the shape of its face or tail. One learns what to do in a social group by watching the others; how to translate a verb by looking at the ending; and whether to engage in certain kinds of activities by considering the consequences. He may learn about people by noting certain peculiarities of expression, gesture, or intonation of the voice.

All of these are samples of cues—that is, particular parts of a situation which are significant in that they are indicators of appropriate action. The learner may acquire a knowledge of the significant cues by harsh experience, but the time and costs of learning can be cut down considerably by instruction. The cue, however, is rarely a definite object which stands unalterably for a particular

kind of action. A decimal point is only a dot, by itself, and has its peculiar significance only on the line in relation to numbers. Above the line it may mean multiplication; on the line, in relation to words, it is a period. An *s* at the end of a word may signify a plural, but there are other ways of forming a plural; and an *s* with an apostrophe may mean a possessive. Thus the response to a cue is a response to a relation between parts of the environment.

Patterns. When parts of an environment are related to each other in some way, it may be said that they constitute a pattern. Thus the parts of an animal—face, head, body, legs, tail, fur, color, and so on—make a pattern. Also, an animal on the street becomes a different pattern from one on a chain, or in a cage, or one being patted or beaten, and will therefore be responded to differently. A man may learn that when he enters a house he must take off his hat, but more specific cue patterns must be sought in some cases: he must distinguish between a dwelling, the corridor of an office building, a department store, a hotel, a church, and a synagogue.

Humiliating mistakes are sometimes made in failing to note the more elusive cues. In such cases a person may respond by analogy—that is, to the similar aspects of an essentially different situation. Thus a man may remove his hat in a department store and be asked by a distressed patron where the ribbon counter is. She, too, has responded by analogy: a man without a hat in a department store is a floorwalker; she failed to note other characteristics which might have revealed her error. Whenever an individual responds as he has done before to a familiar part of a different situation, to people, objects, words, or figures, he is responding by analogy. The new pattern may call for the same response or for quite a different one.

Goal. The patterns discussed thus far have been spatial, referring to the arrangement of environmental parts in various relationships. In such cases the responding individual is really a part of the pattern too. Suppose a child is struggling in the water, unable to swim, while someone stands idly on the shore, not offering to help in any way; it makes a difference, for interpretation of the total pattern, if this observer is a two-year-old, a young man who can

swim, or an elderly lady. Similarly, in a learning situation the capacities and experience of the learner are determining factors as well as his objectives and potentialities.

Thus there is a time as well as a space pattern in learning. The past and the future both make their contribution to what cues and patterns will be, and should be, responded to. This fact is illustrated very clearly in any course of instruction. Individuals who take the course are qualified either by previous courses or examinations they have passed, or by their stage of mental or physical maturation.

The course itself has certain goals or objectives—a mastery of subject-matter or bodily skills, and the parts of the course are selected, practiced, or drilled with the view of achieving this mastery. Thus, in a very real sense, the past and the future, the completed temporal pattern, determine the responses and the learning of the present.

Contiguity. The necessary condition of learning is contiguous experience. Such contiguity has long been recognized by psychologists and has been referred to as association. Ideas were said to be associated on the basis of similarity and contrast, and of contiguity in space and succession in time. A view of a lake will suggest another lake one has visited (similarity), or perhaps a mountain resort (contrast), or the hotel that was next (contiguous) to it, or the trying experiences which followed (succession) the enjoyable lakeside vacation. But all of these are essentially contiguous experiences in that they are closely connected with the lake.

Different kinds of artificial or test situations revealing verbally the nature of this relationship have been constructed. The individual may be asked to say “whatever comes into his mind” or to tell what he associates with some of the things he dreams about. But in the association test he is asked to say as many disconnected words as he can in three minutes, or to respond with the first word that comes to mind to each word of a prearranged list, or to respond with a succession of words.

His responses reveal something of his customary experiences, and may be classified in one of two groups: they will be words

which frequently follow the stimulus word in ordinary discourse like *winter—time* or *dark—night*, or they will represent some logical system. There are many such systems, like synonym-antonym (*winter—summer*), part-whole (*claw—foot*), cause-effect (*sun—heat*), and so on.

Associative shifting. The principle of contiguity is operative in the acquiring not only of mental associations but of overt responses as well. A familiar sample of such learning is the following: A cat is offered some meat which it must stand upon its hind legs to

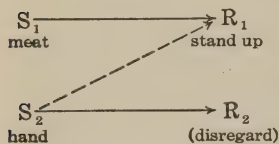


Fig. 23

reach. It responds in the same way when the hand is held out in the same position with no meat in it, though it did not do this before. In this case no new coördination is acquired, but an old one becomes a response to a new situation. The process may be diagrammed as in Figure 23. The dotted line shows the attachment of the response to the substitute stimulus, S_2 , through the contiguity of S_1 and S_2 .

It is to be noted that a single such experience will hardly be sufficient to establish the habit. Repetition is necessary. The formula of associative shifting may then be stated thus: When an ineffective stimulus is repeatedly presented simultaneously with a stimulus which is effective in calling out a certain response, the former stimulus alone will come to produce the response previously connected with the latter response.

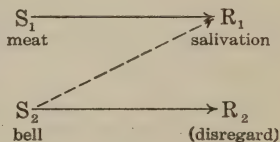


Fig. 24

Conditioning. The contiguity principle also operates in the modification of physiological reflexes ordinarily not subject to voluntary control. Experiments on the salivary reflexes of dogs, conducted by Pavlov and his collaborators in Leningrad, show that with certain modifications the same principle holds. Ordinarily food in the mouth will cause a flow of saliva, but the sound of a bell at a distance will not. However, when the dog is placed in a special apparatus and a tube is connected with the salivary duct

emptying into a gauge, it is found that the salivary response occurs upon the repeated simultaneous presentation of the bell and meat and will eventually occur when the bell stimulus alone is presented. The diagram is the same as for associative shifting (Fig. 24).

The experiments of Pavlov's laboratory and those of other laboratories which followed his lead were so extensive and so numerous that the conditional reflex (or conditioned reflex, as it is usually called) came to be viewed as the basic form or prototype of all learning. The term "conditioning" came to have about the same meaning as the term "habit-forming," and conditioning experiments have been performed on many subjects, animal and human.

In the case of animals, the dog has been the most commonly used experimental animal. Besides the originally ineffective bell stimulus, cold, warmth, tactual and visual stimuli, and many others have been employed. Different tones have also been used, the dog being conditioned to one tone, when another is sounded. If the salivary response does not appear, it is concluded that the dog does discriminate the two tones. Repetition of the same conditional stimulus at intervals of two minutes without following it with the original, unconditional stimulus (meat) results in the extinction or inhibition of the conditional response, which reappears, however, after a period of time or when some other stimulus to which the dog has been previously conditioned is presented. Pavlov termed this latter phenomenon the inhibition of an inhibition.

In the case of human subjects, practically all discoverable reflexes of infants, children, and adults have been conditioned to varying stimuli to which they do not originally react. Some of the most interesting work has been done in the conditioning of emotional responses. If a child is afraid of a dog or antagonistic to the eating situation, the cause is undoubtedly some earlier conditioning. The fear or negativistic response has been called out when the dog or the food was a contiguous experience. Loud barking in the one case and scolding parents in the other are sufficient. The diagrams would be like these:

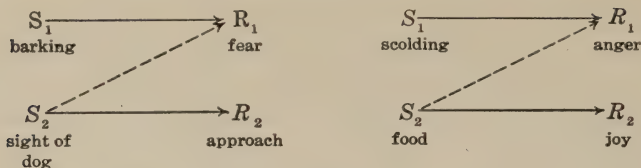


Fig. 25

In such cases, reconditioning may take place naturally, or it may be brought about only by the most careful period of training. Some stimulus must be presented (candy, toy, play with friends, etc.) which will call forth the desired response when the troublesome one is also present (contiguous), albeit in a less intense state. Intensity can be brought up to normal by bringing the disturbing stimulus gradually nearer. Optimum results diagram as follows:

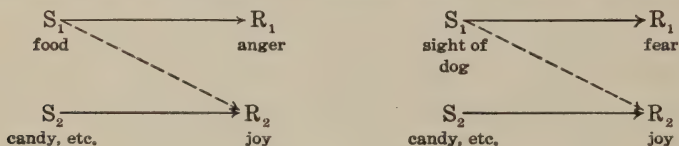


Fig. 26

In such cases of associative shifting or of conditioning, when a response already available comes to be called out by a substitute stimulus which was formerly ineffective, contiguity and repetition are the prime requisites, with intensity varying the frequency of repetitions necessary for learning.

Reward and effect. It will be recalled that when the salivary response to a conditional stimulus in several successive trials is not accompanied by the original stimulus, the amount of saliva secreted diminishes; the response is inhibited. In this case the original stimulus (meat, candy, etc.) may be said to serve as a reward; and so when the reward does not appear, the learned response drops out.

Similarly, in the maze experiments, the food box is the end of the series of coördinations which must be made if the food is to be obtained. It, too, is a reward, and its effect is a continuation of the set until learning is achieved. The rewarded response or coördina-

tion is the correct one, at least from the point of view of the subject, in that it brings to a close the period of hyperactivity and restores the equilibrium of the organism.

In certain cases, particularly in human activity, the rewarded response may not always be what would be called the right one. But the responses which are rewarded, whether they are stealing other people's work or their money, or merely getting a satisfactory score for an awkward performance, or getting one's way by having a tantrum, are the responses which are right in that they are the ones which are rewarded and which will be repeated. Consequently, an important generalization emerges: Rewarded responses tend to be acquired.

It is also true that unrewarded responses tend to be eliminated, but not so promptly. Experiments on human subjects suggest that it is better not to make the undesired response at all than to try to eliminate it by neglect or even by punishment, though the punishment of errors in animal experiments makes the learning of the correct responses much more rapid. But much depends on the pattern of relationships to which the animal is responding.

Sometimes new correct responses are acquired slowly and with difficulty, or a series of correct responses must be made before the final outcome is achieved. Illustrations of such gradual learning are to be found in maze experiments, in puzzle boxes in which two or more latches or levers have to be manipulated correctly before the door opens, and in motor skills generally, like swimming and playing the flute.

In other situations, when but one connection or coördination has to be made, the rest being already acquired, a period of fumbling sometimes precedes the correct response. In later trials the correct response may recur at once, or several trials may be required before the cue is sufficiently well isolated for the response to recur regularly. Illustrations of such more rapid learning are to be found in the puzzle box experiments with but one latch, in the chimpanzee experiments in which the subject gets a stick from the back of his cage to hook a banana toward him which is otherwise beyond his reach outside, and also in such simple connection-

forming as acquiring simple skills like pressing a key or learning the meaning of a word in a foreign language.

In the chapters which immediately follow, the general nature of learning as it has been somewhat systematically presented in this chapter will be described in more detail in relation to the acquisition of different kinds of responses involving knowledge, skill, attitudes, thought, and creative activity.

QUESTIONS

1. Try to describe: (a) the process by which you acquired some new coördination; (b) the steps in training a dog to respond in a certain way.
2. Cite a number of tropisms, giving illustrations. Are they native or acquired responses?
3. Some reflexes and some so-called instincts are more modifiable than others. Name some at each end of the scale of modifiability.
4. List some of the responses you can make to a walking stick. Are there others you could learn to make? Do the same for a rattlesnake; a tennis racquet; a violin.
5. What environmental elements might enter into the making of appropriate responses in the case of the items mentioned in question 4?
6. Mention a number of stimulus situations which might produce the fear response in a child; the running response in an older person.
7. List some of the incentives which you think motivate your studying. What difficulties do you discover in trying to make the list complete?
8. Describe some activity that you continue in without being turned aside except by the most important considerations, and contrast it with an activity that is easily interrupted.
9. Illustrate the different kinds of attention. What is meant by the statement: Attention is selective?
10. What are some cues which are important in indicating the appropriate response? Mention some wrong or non-significant cues which are likely to occasion a wrong response by analogy unless they are viewed in certain relationships.
11. How do the past and future contribute to the learning of the present?
12. Cite illustrations of association by the four kinds of contiguity.
13. Take each of the following words one at a time and write the first

ten nouns it suggests: *lake; police; pork; England*. Analyze your responses.

14. State the conditioning principle in your own words. Give illustrations.

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CHAPTER XIV

ACQUIRING KNOWLEDGE AND SKILL

Effectiveness of learning. Effective learning depends upon the effectiveness of various parts of the process. Some of these parts as they merge into one another in the responses of organisms within the environmental field have already been described. But multiple response, motivation, set, cues, selection, and associative shifting involve sensing, perceiving, and retaining, if there is to be any learning. Furthermore, what is learned is transferable to other and different situations to a greater or less extent. These processes will be described in this chapter.

SENSING

Vision. The eye is a very effective organ in discriminating parts of the stimulation to which to respond, and in controlling the movements which are made in response. In the earliest stages of learning to play the piano, for example, the notes on the page are discriminated, as are also the keys of the instrument, while the eyes watch the fingers to see which notes are being struck. Other senses also contribute, of course—hearing, touch, and the kinesthetic sense (the name given to the feeling of movement and position in the muscles and tendons).

Color vision. Light vibrations striking the retina are interpreted as white light, but are broken up by a prism into the spectral colors, violet, indigo, blue, green, yellow, orange, and red. From violet to red the vibrations range from 390 to 760 millionths of a millimeter. But vibrations are not colors; they are retinal stimuli interpreted as colors. They are sensed by original nature, but the ability to discriminate different hues increases with practice, and is facilitated by their being designated by names.

Sharp color discrimination is possible only at the fovea, the point on the retina directly behind the lens where vision is the clearest. Objects focused on the peripheral area of the retina are almost if not quite colorless. This can be tested by looking straight ahead and having someone slowly move a small colored disk in from the side. The movement will be noted, and the object will appear to be gray before any color is discerned. The same colorless (or achromatic) phenomenon occurs with insufficient illumination and is called twilight vision. Flowers at dusk may be distinguished as lighter or darker gray, but the colors are not distinguishable. In different intensities of illumination different colors seem to be affected differently. Also, because of chemical changes in the retina, and through the action of the iris in making the pupil larger or smaller, admitting a greater or less amount of light, the eyes rapidly adjust to a darkened room or bright sunshine. This process is called adaptation.

Red and green are called complementary colors, as are blue and yellow (see Figure 27). Like black and white, when mixed on a color wheel, they produce a neutral gray which has the gray value of the colors themselves. A color wheel is a simple apparatus for spinning a circular disk in which colors the shape of pieces of pie may be inserted. When other than complementary colors are mixed in this way, they tend to fuse into some intermediate hue. Another characteristic of complementary colors is that when they

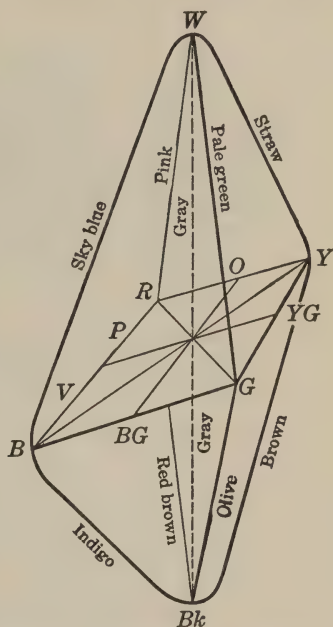


Fig. 27. THE COLOR PYRAMID

The four basic colors are at the points of the square, complementary colors opposite each other, black and white at the points of the pyramid, hues and tints between.

are placed side by side, each seems to increase the intensity of color of the other by contrast.

After-images. If one gazes fixedly and unswervingly at a circular disk of colored paper on a neutral gray background for ten or fifteen seconds and then removes the disk, the image of the disk

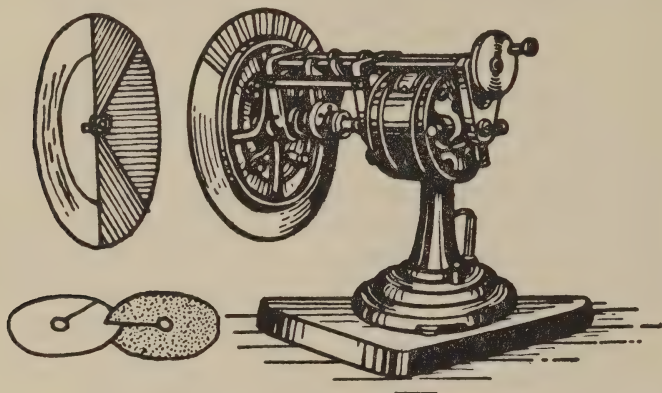


Fig. 28. COLOR WHEEL

Color wheels or color mixers were formerly turned by hand. The illustration shows a back view of an electric motor-driven machine, opposite which is shown the front of the wheel itself, and below two disks such as are used on the wheel in mixing colors. (After Dashiell)

will seem to take its place before the eye, but in the complementary color. This is the negative after-image. It is of peripheral (that is, retinal) origin and is a phenomenon of vision common to all.

After-images really are a continuing activity of the sense organ when the stimulus has been removed; hence they are sometimes called after-sensations. The peculiar thing about them is their seeming objectivity. They are projected outward and look as if they are in the environment, but they move about with the movement of the eyes. They are constantly present, but are not usually noticed unless the stimulus is particularly intense, like the sun or a bright light, or unless one has occasion to gaze intently at some one point. The phenomenon is sometimes referred to as a positive after-image if it is lighter than the medium upon which it is thrown,

or if it is the same and not the complementary color of the original stimulus. But this rarely occurs. It is more than probable that the aura or halo pictured by Renaissance artists is derived from the after-image of the face gazed at in wrapt adoration.

Quite different phenomena are *memory images*, what one sees "with the mind's eye," called centrally aroused sensations. These are not peripheral (or retinal), but are somehow a product of the brain itself. They are not complementary to the original stimulus, and are less constant, more shifting, and more flexible than the after-image, less external to the observer. Their intensity varies greatly from person to person. Some persons report that they can "see" the things or people they think of as clearly as if they were actually present, while others report no such ability whatever.

Many studies have recently been made of what is called *eidetic imagery*. This is a peculiarly clear and vivid form which relatively few people possess. It is like the after-image in seeming external to the observer—he looks *at* it—and it is like the memory image in that it may be reinstated some time after the stimulus object has been observed. Individuals vary in the vividness and flexibility of their eidetic imagery.

The usual method of testing for it is to present a picture or list of words or some other such visual object for a few seconds and then ask the subject to reproduce it orally or with a pencil. Some can write down the first word in each of several lines of print just as if they were reading them from the page itself. Others can reproduce drawings with surprising accuracy, reporting that they are simply tracing the outlines of the image which they throw on the drawing paper. Eidetic imagery appears most frequently in children, and usually grows fainter and disappears during the adolescent and adult years.

Defects of vision. Because of the demands made upon the eyes in reading and writing, minor visual defects are very troublesome. Perhaps the most common is astigmatism, caused by some irregularity in the shape of the lens or of the cornea (the transparent covering or pupil of the eye). Astigmatism may be discovered by means of a chart on which heavy black lines of the same width are

drawn radiating from a center. If some of the lines look heavier than others, astigmatism is present. Far-sightedness or hyperopia, and near-sightedness or myopia, are defects of vision caused by an uneven curvature of the lens resulting in a focusing of the image respectively behind and in front of the retina, instead of exactly

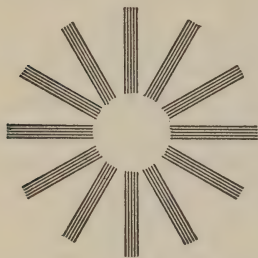


Fig. 29. ASTIGMATISM CHART means.

Astigmatism is revealed on the axis in which the lines appear heavier. Cover one eye when looking at the chart.

Color-blindness is more common in men than in women. Most frequent is the inability to distinguish red and green, which makes the choice of these colors for stop-and-go signs very unfortunate. Yellow-blue color-blindness is extremely rare.

Total blindness may be congenital or the result of disease or accident. The life of the blind has been made more endurable than formerly by the publication of books for them written in a system of raised type called Braille, and by special schools which give instruction in reading these characters and in writing and computing by similar methods. Dogs are trained to lead the blind safely through city streets, and drivers of motor vehicles and others respect the white cane which symbolizes the great misfortune of loss of eyesight.

Audition. The ear, like the eye, aids in the control of movement, but only when sound is the result, as in the case of playing a musical instrument. Auditory discrimination is as sharp as visual, the human ear being capable of distinguishing about 11,000 differences in pitch, to say nothing of countless variations of sound.

Pitch is the quality which distinguishes one note from another

above it or below it on the same instrument. Differences in pitch are caused by differences in the rate of vibration of a wire (piano or guitar), of a reed (clarinet or oboe), of a column of air (flute or organ pipe), or some other matter.

A wire, for example, vibrates back and forth very rapidly; the shorter the wire, the more rapid the vibration. One vibration of the wire over and back is called a double vibration (dv.) or cycle (\sim). There are 256 such vibrations per second at middle C (C^1), and 512 at C^2 , an octave higher. Any tone has half the number of vibrations of that of an octave above.

People differ considerably by nature and training in their ability to discriminate pitch, and in children such ability increases with age. Some can distinguish between two tones played consecutively which are as little as one-half a vibration apart. While pitch discrimination is like intelligence in that no amount of training can provide an ability which an individual does not possess, nevertheless training can bring about considerable improvement.

The intensity of a sound is produced by the amplitude of the vibration—the distance which the vibrating material moves back and forth. Many different intensities can be distinguished.

The timbre of a sound is that peculiar quality which distinguishes it from other sounds of the same pitch and intensity and so gives the distinctive character to different musical instruments. Differences in timbre are produced by different overtones. A string may vibrate as a whole (Fig. 30 a), or it may vibrate in halves; and it may do both at the same time, in which case the tone and its overtone an octave higher may be heard. It may likewise vibrate in other fractions (Fig. 30 b). Other mediums vibrate in different fractions at different intensities, thus producing a wide variety of overtones.

It is not quite accurate to say that overtones alone distinguish the different musical instruments, for varying amounts of irregular vibration mingle with the tone, particularly in plucking and percussion instruments—the harpsichord, the xylophone, and the pianoforte being good examples. It is sometimes said that a noise is distinguished from a tone by the irregularity of vibration of the

former as contrasted with the regularity of the latter. But this is only partially true; perhaps the best definition of noise is psychological rather than physical: noise is auditory sensation which is displeasing to the individual. But this is not satisfactory either, for there are welcome noises and unpleasant combinations of tones. The pleasantness or unpleasantness of a sound is partially a matter

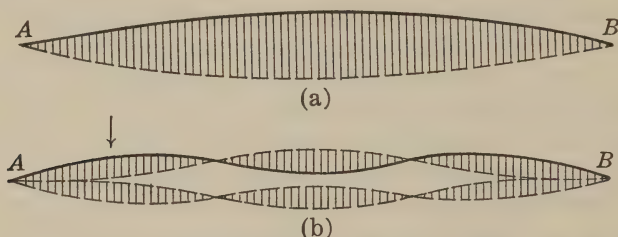


Fig. 30. DIAGRAM OF A STRING VIBRATING AS A WHOLE AND IN THIRDS
(After Warren)

The solid line is a violin string fastened at *A* and *B*. It may vibrate as a whole (a), but if it is plucked $\frac{1}{6}$ of the distance from the end (at arrow), it vibrates in thirds (b), besides vibrating as a whole. The smaller vibration produces the overtone or harmonic. (The amount of vibration is exaggerated in the figures.)

of regularity of vibrations, but also of intensity, and of the associations or reactions aroused by the auditory stimulation.

Defects of hearing may be confined to very high tones, or sometimes groups of tones of a restricted pitch range, called tonal islands. They are more noticeable, however, when they occur for all sounds to a less or greater degree. Partial deafness is not very common; but it is frequent enough to call for systematic school testing in order that appropriate steps may be taken. The manual alphabet enables the deaf to communicate with each other, while lip-reading permits communication with others too.

The chemical senses. Smell and taste (olfaction and gustation) depend for their stimulation upon the chemical constitution of the air breathed or of the liquid taken into the mouth. Their chief advantage is aesthetic, though they are to a certain degree protective. They serve less as a basis for the control of movement in man than they do in many of the lower animals. Discriminations,

while they are numerous, are not so sharp as in the case of sight and hearing. The qualities of food tasted are in reality a fusion of the sweet, sour, bitter, and salt of the taste sense proper, of many odors, and of temperature, contact, and kinesthetic stimulations.

The skin senses. Temperature and touch, the senses of the skin, are similarly subordinate to the eye and ear in man. The temperature sense is really a combination of two—hot and cold. This can be demonstrated by the so-called punctiform method of investigation. A large nail warmed in hot water, when touched to the skin systematically at all points within a square inch on the inner surface of the wrist, feels warm at only relatively few contacts. The same instrument chilled in ice water feels cold at different points. These can be charted on the skin or on graph paper.

The sense of touch is at least three senses—contact, pain, and pressure. The first two can be distinguished by the punctiform method, using a dull and sharp point respectively. Some points give no sensation of contact or of pain. The pressure sense is introspected as different in quality from either of the others.

Kinesthetic, static, and organic senses. Kinesthesia is the sensing of movement in the muscles, tendons, and joints. Weights are distinguished by kinesthesia, which also is extremely important in the direction and control of movement. It operates most effectively in coöperation with the contact sense in the acquisition of all motor skills.

The static sense is the sense of equilibrium and is controlled by a small organ in the inner ear. It is this organ which is upset in cases of nausea; and with kinesthesia it exerts its constant control of posture and balance.

The organic sense reports sensations of pressure or strain within the body cavity. It is extremely untrustworthy, however, since it is poor at discrimination and also exceedingly inaccurate in localization. The stimulus of a headache, for instance, may be in the stomach, an illustration of “referred pain,” of which there are several examples. Many of the elusive organic sensations, however, go to make up the very important feeling tone of the individual, upon which his happiness so much depends.

Attributes of sensation. All sensations have certain attributes or characteristics. One of these is quality. The quality of a sensation is referable to the end organ receiving the stimuli. Indeed, there is a doctrine, that of the specificity of function of sensory ends, to the effect that any sense organ can report but one quality however it may be stimulated. Thus the eye reports light whether from light vibrations, or from pressure on the eye, or from electricity.

Another attribute of sensation is intensity. Light may be bright or dim, sound may be loud or soft, odors may be strong or weak, and so on, with an infinite number of gradations from the most intense to the barely distinguishable. Many careful experiments have been performed to determine how small the differences in intensity are which can be noted. The unit of measurement is the just noticeable difference (j.n.d.), and it has been found that the greater the intensity the greater is the j.n.d., when the latter is measured in absolute units. That is, a very small difference between two dim lights can be noted, but bright lights have to have a greater difference between them to be distinguished. This fact, when mathematically stated, is called Weber's law.

A third attribute of sensation is duration: a stimulus may effect the sense organ for a shorter or longer period. The sensation likewise may continue after the stimulus has been removed, producing the after-sensation, not only in the case of vision but for other senses as well.

A fourth attribute of sensation, extensity, is characteristic of certain senses. In the case of vision and touch, extent corresponds to the area stimulated on the end organ—retina and skin, respectively. It may also apply to taste and kinesthesia, though in the case of these latter, the size or area stimulated is determined with much less exactitude. Whether there is such a thing as a large smell or sound (distinguished from intense) is a matter of doubt, or perhaps of definition.

PERCEIVING

Simple space perception. Perceiving is essentially apprehending relationships of patterns of stimuli. These patterns may be rela-

tively simple, as in the case of space perception. Two points touching the skin simultaneously are perceived as two if they are far enough apart, though the necessary distance (limen or threshold) varies according to whether the points touched are on the lips, finger tips, arm, or back. If greater than the limen, the distance between the two points can be more or less accurately judged. Similarly, the distance between two points equidistant from the eye can be quite accurately perceived, though allowance must be made according to how far away from the observer they are.

Depth perception, or the judgment of distance from the eye, depends on a number of factors: the apparent size of familiar objects, dust particles in the air, color, and the interposition of objects shutting off a part of the view of others. The kinesthetic sensations of visual accommodation are also a factor, as is the fact that we have two eyes to see with, for binocular vision permits a view of an object from two different points at the same time, giving a perspective which monocular vision does not furnish.

Errors of perception normal to man are called illusions. A number of spatial illusions have been catalogued, some of which are shown in Fig. 31. With practice one can train himself to overcome the illusory effect to a considerable degree.¹

Time perception is based on the duration of sensations—or absence of sensations. The length of the interval which elapses between two sensory stimulations (flashes of light, sounds, touches on the skin, and so on) can be perceived and fairly accurately judged, though a number of psychological factors interfere with the accuracy of such judgments. Some of these are expectancy, weariness, enjoyment, and the like. Improvement comes with practice in judgment of the length of both space and time intervals.

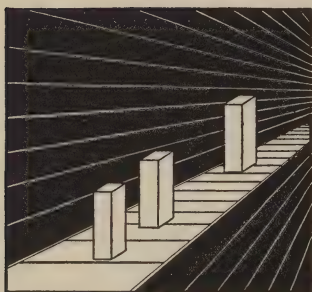
Regularly recurring intervals are recognized in temporal patterns called rhythm, marked off, for example, by the heartbeat, breathing, and walking. Such patterns are basic biologically and are amplified in numberless complex forms in the dance and in music.

Sensory patterns. One perceives things; and things are stimulus objects related in some kind of pattern. Areas of inclosed or par-

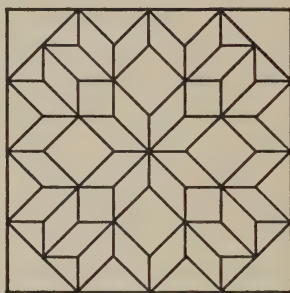
¹ See footnote on page 343.



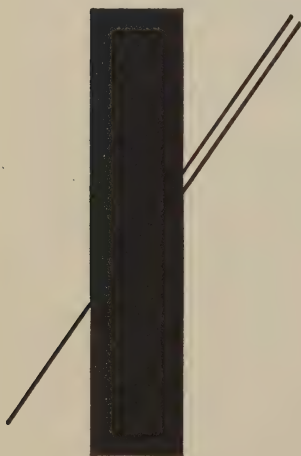
(a)



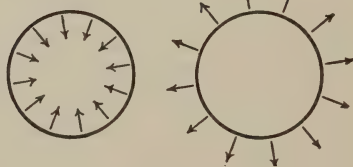
(b)



(c)



(d)



(e)



(f)

Fig. 31. SPATIAL ILLUSIONS

tially inclosed space, like geometric figures, set themselves off from their background to be perceived as things. Familiar objects such as stones, chairs, or houses similarly have outlines; and to this is added the fact that the pattern recurs, and is often movable and usable as a whole. It is rather difficult to perceive parts of a chair, the floor, and a wall, for example, as a single pattern. Similarly, a hat is thought of as one thing, a face as another; when the hat is put on, the two merge into another pattern which may be much less attractive than each one separately. The fine arts are concerned with the aesthetic appeal of various patterns of form, color, and rhythm (temporal pattern).

Responses are made, as suggested in the preceding chapter, to various combinations or patterns of the stimulus situation, and these patterns are created by the individual. If the appropriate response in a certain situation is to a certain pattern of stimuli which a person does not perceive, he cannot make the appropriate response.

SENSORI-MOTOR LEARNING

Sensory control. The name "sensori-motor learning" is given to acquired coördinations in which the change in the response capacity of the individual is the significant outcome, and in which the process is under sensory control. An individual may know what the appropriate response is to certain stimuli; but he cannot make it if it is not available.

Availability of response is brought about by the process of sensori-motor learning. The motor coördinations to be acquired may involve the movement of the whole body, as in swimming, or of the hands and arms as in writing, carpentering, playing a musical instrument, and other so-called "manual" skills, or of the vocal apparatus as in pronouncing new words or singing.

The sensory control varies with the coördination, though kines-

¹ In Figure 31 (a), are the lines parallel? (b) Which prism is the tallest? (c) Is the figure "flat" or in perspective? (d) Which of the two slanting lines at the right is continued to the left of the thick line? (e) Which circle is the larger? (f) Which figure is the larger?

thetic, static, visual, and often auditory sensations have the important rôles.

The identifiability of the stimulus is a significant element in sensori-motor learning. If the learner cannot distinguish the wrong note from the right one, or the correct from the incorrect pronunciation when he hears it, he can hardly be expected to make much progress in his learning. Skills, however, are not just single responses to single stimulus situations. They are movements continuing through time which are constantly under the control of changing stimuli, some of which are the kinesthetic stimulation of the response movements themselves.

In the case of the laboratory exercise of tracing a star while looking only at its image in a mirror, the boundary line of the star and the movements of the pencil as well as the "feel" of the hand movements (kinesthesia) are continuing stimuli involving continuing movement. In learning to swim, the static sense is disturbed by the unusual body position, and the temperature sense, the organic sense (for example, in breathing), and other senses are continuously stimulating successive movements, the kinesthetic stimulation of which serves as stimuli to still other movements.

Repetition. In a precise sense, particularly in the process of learning, no movement can ever be an exact repetition of a previous one. Nor should it be; for such repetition would result in no change, and hence in no learning. However, varying responses can be made again and again to the same stimulus pattern, though this in itself may not be productive of learning. A selection must be made in some way among the responses which are called out.

Multiple responses are made to various sensory cues, some of which are rewarded by the teacher or coach perhaps with a word or nod of approval, or by the learner himself perceiving that they are of the desired sort or are in the direction of the goal sought. The responses thus rewarded tend to be repeated in future trials, while the responses not thus rewarded tend to drop out.

Only the rewarded (that is, correct) repetitions are particularly effective, and these are necessary in sensori-motor learning. Prac-

tice involves this kind of repetition, and it is such practice which "makes perfect."

Pattern reaction. Examples of the multiple responses which tend to drop out as learning proceeds are numerous. The strained grip on the pencil, club, racquet, or tool, the set jaw, the facial grimace—all these and many others are gradually eliminated.

As the coördinations become more automatic and the finer points are gradually mastered, the skill improves, and the standards of performance demanded gradually rise. The question then comes up of the degree of mastery sought. There is, of course, a physiological limit of speed beyond which the human organism cannot go, but this will never be exactly determined until world's records cease to be broken. There is also an individual limit for each learner, likewise undetermined, which he cannot exceed. Below this is a practical limit which it would be of questionable value to attempt to pass.

For example, the greatest speed of typing attained up to the present is 132 words per minute. But a professional typist is considered competent who can do 60 words per minute. It is questionable whether it would be profitable for a person who types his own letters to spend the time required to bring his speed up to that level. Both the occasional typist and the professional, however, could improve their performance if it were necessary to do so. The same thing is true of other sensori-motor skills, such as sending and receiving in telegraphy, running, hurdling, and swimming, and also in other skills in which quality of performance is the standard, like handwriting, or playing the piano, speaking a foreign language, or reading.

RETENTION

Retention of motor skills. When once acquired, motor skills tend to be retained over long periods without much practice. When one has once learned to swim or skate or ride a bicycle, he can do it for the rest of his active life. There have been various explanations of this. The one which is probably the most satisfactory is that the coördination is relatively simple and is repeated numberless times.

But the proposition as a whole is unfortunately not quite true. When the skill is more complex, as in playing the piano or violin, or when the skill has been brought to a very high level of excellence, a period of no practice is followed by inferior performance. The law of disuse operates, and the price that must be paid for superiority in any complex skill or art is continued practice.

Retention of knowledge. The process of acquiring knowledge is in large measure a process of acquiring (1) verbal skills; (2) substitute responses; (3) abstract meanings. The first two have been discussed, and the third will be considered in Chapter XVII; however, the three are not actually separate in experience. Verbatim memorizing is essentially a verbal sensori-motor skill, the stimuli

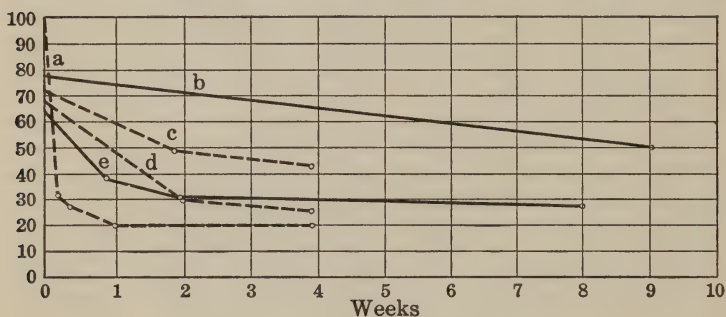


Fig. 32. CURVES OF FORGETTING

(a) Nonsense syllables (Ebbinghaus); (b) college zoölogy; (c) technical passages—spaced repetitions in learning; (d) same—unspaced repetitions; (e) psychology lectures. The score is the average per centage correct of the total possible score. After four months the college zoölogy score had dropped rapidly from 76 to 42 per cent; and after twenty months, more slowly to 32 per cent. Curves for elementary and high school subjects are quite similar. (After Greene)

being words and the responses vocal coördinations. Getting the gist or thought of a paragraph to repeat it “in your own words” is an associative or conditioning process of a complex sort, and the acquisition of abstract meanings is a selective, perceptual, pattern-making process.

Perfect retention at any time implies the ability of the learner to make at least one errorless repetition of what he has learned.

In experimental work, two consecutive errorless repetitions are used. The pioneer experiments in retention and forgetting were reported in 1885 by Ebbinghaus, who served as his own subject. He used three-letter nonsense syllables like *lub*, *joz*, *maf*, etc., because they are freer from associations than words or connected prose and so make more equivalent units of measurement. He memorized lists of these by a systematic method, and then after varying intervals timed himself in relearning them. Thus, instead of using the less exact method of measuring forgetting by amount recalled, or number of promptings needed to complete the material previously learned, he first employed the relearning time as a measure of retention. The longer it took to relearn, the more had been forgotten; or, the more time saved in relearning, the more had been remembered. He found that the forgetting was most rapid at first and then more gradual, as described by the curve of forgetting (Fig. 32). Later experimenters have confirmed his findings, though it has been found, as would be expected, that with meaningful material forgetting is not so rapid.

Inhibition. Sometimes the inability to recall what one has learned is not due to a gradual fading-out process, but to a kind of blocking called retroactive inhibition. In such cases what is learned interferes with the recall of what has been previously learned. This is quite likely to occur when one is attempting to recall a name or a technical term. Later associations impair those which were made earlier.

TRANSFER OF LEARNING

Meaning of transfer. Many controversies have been waged over the influence of learning one thing upon the learning of another. For example, it has been argued that memorizing words, perhaps in language study, "trains the memory" so that one can remember other things, such as names and faces, better. And some have said that practice in observing natural phenomena, as in the study of science, "trains the powers of observation" so that one can observe other things, such as personality characteristics, more accurately.

Indeed this doctrine of training the mind, or formal discipline

as it is called, has been generalized to include whole courses of study which, it has been contended, build up a "general power" that may be made available in any life situations. The doctrine of formal discipline is based on the now discredited faculty psychology, according to which the several abilities or faculties of the mind, like remembering, perceiving, imagining, judging, were thought of as separately functioning units. If this were the case, the training of one of them might conceivably strengthen it so that better performance would be the outcome.

A number of experiments have been performed to determine the extent to which the doctrine is true. The plan of the experiment is to test some ability, then give training to the "faculty" supposedly involved, and then test it again. Control groups take the end tests but not the training. In this way a number of different mental functions have been tested out: the transfer of memory for nonsense syllables to memory for numbers, letters, words, and poetry; of judgments of areas and weights to widely different sizes; of discrimination of different shades of red to other shades; of sound intensities to light intensities; of maze learning to other images; and many others. In practically all these studies the experimental group has shown a small amount of gain over the control group.

A similar series of experiments has been conducted to determine the effect of instruction in various school subjects—for example, the effect of training in Latin on English vocabulary and spelling; of training in arithmetic computation on arithmetic reasoning; of training in formal grammar on reasoning and correct usage; of training in geometry on performance in geometrical and non-geometrical test materials; and so on. But these studies have shown, in the case of Latin, for example, that while the pupils who had studied Latin could spell and determine the meanings of Latin derivatives better than those who had not, they were little if any better with words of Anglo-Saxon origin. And if they were better in English after studying Latin, they were also better before they had studied any Latin at all. In other words, those who studied Latin were more intelligent to start with; the language merely

served as a selective factor. All experimental gains were slight, but they were greater when the end tests were like the training material.

Positive and negative transfer. Experiments on transfer disclosed, then, that while in many cases there is a positive relationship between improvements in one mental function and in another, it is slight, and that in some cases it is due to selection. This is true of "faculties," of school subjects, and also of sensori-motor skills.

A peculiar case of the latter should be briefly mentioned: the transfer of the learning of a motor skill from one side of the body to the other. A skill which has been acquired with the right hand can be more quickly learned with the left than it can when the right has not been thus previously trained. This positive effect of what is called cross-education is uniformly found.

But negative transfer, or interference, likewise occurs in learning, operating somewhat like retroactive inhibition. Thus children do not begin two foreign languages at the same time, for what is learned in one may interfere with the learning of the other. Similarly, one motor skill may interfere with another—the grip in baseball and golf, or running in football and basketball.

Identity, generalization, and pattern. The earlier doctrine of formal discipline has been shown by experimentation to be untenable, but this does not mean that there is no truth in it. One should not go to extremes, but learn to make distinctions. The problem needs rewording: To what extent and under what conditions does learning in one situation or context facilitate learning in another? So stated, the problem still remains; however, the direction in which the answers may lie may be tentatively indicated.

In the first place, when a response or group of responses learned in one situation is appropriate in another, learning them in the first may occasion their transfer to the second situation. This is a case of analogy, and may be illustrated by adding in multiplication, Latin vocabulary in Spanish, or playing tennis and squash. There may be some interference, say in pronunciation or timing, in the last two illustrations; but the situations are analogous, and much of what is learned in one case is usable in the other. The originally acquired learnings and skills are transferred to the new

situation because there are identical elements in the two situations. The transfer may be automatic, or it may be recognized and voluntarily effected.

Secondly, experience may be generalized in such a way that what is done in one situation may be recognized as applying a principle which may be differently applied in the new situation. Thus principles learned in the study of mathematics or natural or social science may be applied in an endless number of situations—providing, of course, that the individual recognizes when they are applicable.

It is possible for a student to amass a great number of facts without seeing their relationships and implications, without recognizing that they support generalizations which are applicable in other situations. Then when another situation presents itself, since he does not recognize it as a special case of the general principle, the appropriate response will not be forthcoming. For example, certain generalizations concerning the interior angles of a triangle may be known, but if a part of a new figure is not recognized as a triangle, the knowledge of the generalizations does not transfer. Similarly, a particular phenomenon may or may not be recognized as a special case, say, of the principle of gravitation, or of Mendelian heredity, protective coloration, German romanticism, eighteenth century French idealism, a cultural tradition, hyperopia, monarchical usurpation, submarginal land cultivation, the cultural effect of blighted or interstitial housing areas, or compensation for inferiority.

Recognition of applicability may be influenced decidedly by teaching. The various courses in which the data appear regarding the cases mentioned above, and many others, may be taught in such a way that the student will recognize evidences, examples, or applications, and react accordingly. If they are so taught, his learning will "transfer," and some of the advantages claimed under the doctrine of formal discipline will be obtained. If they are not so taught, the student may pass his examinations and graduate from college, but he will not be truly educated.

Of course, the ability to see such relationships and applications is not all derived from teaching. In large measure it is determined

by the native intelligence of the individual. The ability is needed to see in a pattern of relationships things which do not usually appear in that pattern. A generalization, be it a scientific law or principle, or a concept, is a pattern into which various parts may be fitted. If the learner recognizes that the situation which confronts him is a part of a certain pattern, his learning transfers, and he may be able to make the appropriate response. If he does not thus recognize the situation, he cannot respond appropriately, and his learning has done him no good.

QUESTIONS

1. Illustrate what is meant by discrimination and control in connection with the several sense avenues.
2. Try the demonstration experiments on peripheral vision and negative after-images and report the results.
3. Rate the vividness of your memory images on a six-point scale ranging from 0 (no imagery) to 5 (imagery as vivid as actual sensation) for the following things: *vision*: a rose, the front of the building you are in, the words and music of the first line of "America"; *audition*: a familiar church bell, the note of a violin, the sound of a saw; *olfaction*: coffee; *gustation*: salt; *touch*: sandpaper, velvet; *temperature*: piece of ice; *pain*: pin prick; *kinessthesia*: carrying a suitcase; *organic*: stomach ache; *blend*: lemonade.
4. Check your eyes and ears for astigmatism or other defects, using such apparatus as is available.
5. Hold down the "loud" pedal on the piano, and strike a note vigorously; then release the pedal gradually and listen for the overtones. What do you hear?
6. Discover the two-point limen on various body surfaces.
7. Can you overcome the effect of any of the spatial illusions in Figure 31 with practice?
8. Try to account for any misjudgments of elapsed time that you can recall.
9. Describe the different patterns made by the group of five dots. Can you make the sixth dot fit into a pattern with the others?
10. It has been suggested that a hat may look well on a person while seated but not while standing. How can you account for this?

11. What is meant by the phrase: "It doesn't fit into the picture"? Illustrate.
12. Suggest some responses that to you are not available; some stimuli that are not easily identifiable.
13. The response which is right, from the point of view of the learner, is the one which is rewarded. Discuss.
14. Cite illustrations of the practical limit in sensori-motor skills. Under what circumstances might it no longer be practical? What can be done about it?

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CHAPTER XV

THE ACQUISITION OF ATTITUDES

Attitude defined. "What do you think of so-and-so?" one is often asked. An opinion is called for, a judgment on the characteristics and abilities or the social adaptability of a mutual acquaintance. But besides the rational judgment something else is expected, perhaps a statement of whether the person is liked or disliked. Affective or emotional elements come to the fore. Furthermore, the motivational aspect of one's attitude toward the person is significant. An attitude of aversion, for example, is apt to lead to unfavorable opinion. Lastly, the question of modifiability may arise in connection not only with the opinion itself but also with the intensity of the emotional feeling aroused. The task of developing and changing attitudes is one that is of great concern to many classes of professional people, teachers, newspaper owners, advertisers, lawyers, and clergymen.

An attitude may be defined as a set or readiness to respond in a definite way to stimuli of a general or specific character. One may have an attitude toward anything he can perceive. An attitude may be mild or indifferent, or it may be sufficiently strong and positive to be the dominating factor in one's life. Attitudes toward racial and vocational groups, toward science, art, or religion, bespeak the particular set of values by which one lives.

LIKES AND DISLIKES

Native satisfiers and annoyers. A number of conditions are so universally liked or disliked by mankind in general that certain attitudes are assumed to be native—that is, inborn and unlearned, just as sensing light and sound are inborn and unlearned. Efforts which have been made to list and classify likes and dislikes, however, have not received universal acceptance. This is partly because

of the complexity of the combinations of things and the relatively small differences in them which may be very significant in creating an attitude. It may also be due to the influence of the individual's own experience; that is, of the learning and conditioning which have taken place. An attitude then becomes a conditional or substitute response, and the like or dislike is thus not native but acquired.

E. L. Thorndike, however, has presented a tentative list of what he has termed original satisfiers and annoyers, which may furnish the key to an understanding of individual behavior in a number of circumstances. His list follows: ¹

Satisfiers

I. (1) sweet tastes, unless one is replete, (2) fruity flavors, unless one is replete, (3) nutty flavors, unless one is replete, (4) meaty flavors, unless one is replete, (5) salty tastes, after deprivation, (6) chewing, after deprivation, (7) a full stomach functioning normally, (8) liquid in the mouth, in case of dryness of the membranes, (9) swallowing liquid, in case of dehydration of the body

II. (1) warming the surface of the body, after chilling below habitual temperature, (2) cooling the surface of the body, after heating above habitual temperature, (3) cooling the upper alimentary tract, after heating above habitual temperature

III. (1) muscular activity, after deprivation; especially rhythmical activity and running, jumping, climbing, swinging, dodging, clinging, reaching, grasping, pulling, throwing, (2) muscular inactivity, after abundant exercise

IV. successful courtship and love between the sexes including various activities and experiences in connection with display, attention-getting, pursuit, allurements, capture, submission, fondling, etc.

V. successful motherhood, cuddling and fondling a baby, nursing it, protecting it

VI. (1) approaching what one pursues, (2) leaping upon what one pursues, (3) seizing what one pursues, (4) forcing what one pursues into quiescence

VII. (1) struggling with an animated opponent, (2) clutching it, throwing it down, (3) being on top of it, (4) shoving it aside, (5) escaping from its clutches

¹ E. L. Thorndike, *Adult Interests*, pp. 177-180. Macmillan, 1935. Quoted by permission.

VIII. (1) the presence of human beings, (2) concerted action as one of a crowd

IX. (1) receiving favorable attention, (2) humble approval from any person; admiring glances and sounds, (3) smiles and fondling from those above one in mastery-status, (4) friendly behavior

X. (1) submissive behavior of others when one is set toward mastery, (2) submissive behavior by oneself when one is set toward submission

XI. (1) attaining before others do a goal which they seek, (2) pulling toward oneself an object which others are trying to pull toward themselves, (3) holding what others are trying to take away from one, (4) getting the attention of one whose attention others are trying to get, (5) other successes in instinctive rivalry

XII. (1) seeing and hearing children laughing, gurgling, cooing, crowing, smiling, snuggling, (2) giving bits of food to a child or animal and seeing it eat

XIII. a feeling of security and confidence, often aided by (1) being in familiar surroundings after deprivation therefrom; (2) the company of familiar persons; (3) "being in a sheltered nook open on only one side"; especially having something solid behind one

XIV. excitement and elation, often aided by change of scene, rapid motion, and exploration

XV. unforced mental activity

XVI. curious examination, manipulation, and dismemberment of objects

XVII. the normal flow of life. (This is satisfying rather than indifferent. Annoyances come as contrasts to, and pronounced satisfactions as accentuations of, a general status of content.)

Annoyers

I. (1) bitter tastes, (2) very sour tastes, (3) pangs from the contractions of an empty stomach, (4) faintness, (5) nausea, (6) dryness of the membranes of the mouth, (7) other features of thirst

II. (1) continued chilling of the body, (2) continued overheating of the body

III. (1) muscular activity when weary, (2) muscular inactivity when craving exercise

IV. (1) thwarted courtship; unrequited love, (2) losing the baby one has mothered

V. (1) being interfered with in one's movements by being held, op-

posed, pushed, etc., (2) being thwarted in any original tendency, (3) being confined in a small inclosure

VI. being seized, slapped, or bitten

VII. the presence of another male of the same species when one is courting a female

VIII. solitude

IX. (1) being neglected, (2) scorn; derision

X. the perception of another getting attention, affection, or approval which one craves for oneself

XI. seeing and hearing children in distress

XII. (1) strangeness *per se*, (2) too long absence from familiar surroundings

XIII. seeing and hearing children in distress

XIV. darkness

XV. being unexpectedly brushed or clutched

XVI. large objects advancing toward one violently

XVII. snakes

XVIII. contact with worms, spiders, and other crawling things

XIX. howls, moans, groans, squeaks, grating noises, human cries of pain and rage

In addition to the many shades of attitude of satisfaction and annoyance which may be regarded as common to mankind, there are countless likes and aversions which are peculiar to any one individual. Over two thousand different annoyances have been assembled and classified by one enterprising collector. His specimens include the following: to see a person chewing gum, to hear jazz music, a person slapping me on the back in a familiar manner, to hear a person say "ain't," a person scratching his head, songs and poems about "Mother," to hear an adult lisp, cockroaches, to see a dirty collar on a man, a strong odor of perfume from a woman.

These are aversions to conditions which all reporting them have experienced. Another inquiry sought to determine the amount of money that would be required by the subjects to make them endure various sufferings and deprivations which they have not experienced. Though the subjects were all unemployed, the price range was wide. The following are a few examples:¹

¹ E. L. Thorndike, *op. cit.*, p. 181.

TABLE V. STRENGTH OF AVERSIONS

<i>Item</i>	<i>Estimates of Money Equivalent in Dollars</i>	
	<i>Median 20 Men Age 20-29</i>	<i>Median 20 Women Age 20-29</i>
Lose left arm	1000 million	1 million
Lose one ear, hair, and have pockmarks	125,000	2 million
Be in a trance two months of the year	2 million	200,000
Be confined to an apartment	10 million	62 million
Eat a beetle and earthworm	48,000	950,000
Practice secret cannibalism	110,000	750,000
Practice public cannibalism	260 million	125 million
Act the fool on the street	125	75

On the other hand there are the things one would like to do. The measure of the liking in one experiment ¹ was the number of days one would endure in prison at hard labor (but with no disgrace attached) for the privilege.

TABLE VI. STRENGTH OF LIKES

<i>Item</i>	<i>Average Number of Days Estimated</i>	
	<i>Young Men</i>	<i>Young Women</i>
Hour's talk with Mussolini	.5	.8
Hour's talk with Stalin	1.6	2.4
Hour's talk with Roosevelt	4.2	1.0
Hour's talk with Garbo	.7	.3
Two-week trip to Caribbean	11.2	31.3
One week in Washington	1.2	2.1
One-year cruise around world	67.3	100.6
\$500 cash	43.2	31.1

¹ E. L. Thorndike, *op. cit.*, p. 183.

These results are reported for a very small number of subjects, but there were wide individual differences not shown by the averages, as well as marked sex differences and slight differences between younger and older groups. Some of the milder aversions such as that to handling a snake and taking cod liver oil have been reduced by actually experiencing the situation a number of times, so that the dislike has become indifference in some cases, and in some a mild liking. The reason for such a change of attitude is primarily the fact that the experience changes: it is not so bad as the subject originally thought it was.

Conditioning attitudes. The question naturally arises as to the origin of some of the individual likes and dislikes. How is it that the aversions of some are much stronger than those of others to certain stimuli, and why do some people like one thing and others dislike it? The easy answer is that attitudes are learned, that children take over the attitudes of their elders just as they acquire their ways of dress and manner of speech. Yet one often finds children in the same family growing up with quite different opinions and ways of looking at things from those which their elders possess. The influence of small-group environments to which different people are subjected may account for the difference. In any case, a conditioning process is at work such that the new idea, point of view, or outlook is in some way a contiguous experience with an attitude already operating. The new attitude or the attitude toward the new situation is rewarded, perhaps by merely being acceptable, perhaps by group approval, and the "substitute stimulus" thereafter operates automatically. A displeasing individual utters views which are therefore displeasing even when they are later met elsewhere. Contrariwise, the views of a person whom one esteems have added value and weight and are apt to be accepted unquestioningly.

Prestige, as this phenomenon is called, has been demonstrated experimentally by having subjects judge the merit of anonymous verses of varying degrees of excellence, and then having them judge them some time later when the writers' names are given. A decided number will switch the verses of accepted poets to a higher

rating than they gave them before they knew who wrote them. Prestige is recognized in all the persuasive arts—for example, in oratory and advertising. A good speaker will not quote an authority until he has first built up the importance of the authority to be quoted. Advertisers are wont to show pictures of very professional-looking physicians, scientists, chefs, or hostesses recommending their wares. It is one of the evidences of a truly educated mind that it can distinguish between the prestige value of a suggestion and its actual value.

Social attitudes. Favorable or unfavorable attitudes toward individuals or groups of individuals or institutions are influential in determining the mode of life and even the happiness of large portions of mankind. Aversion, for example, may have many degrees of strength from a mild dislike to positive abhorrence. In fact a scale of social distance has been devised, based primarily on the amount of space that a person may wish to have between him and someone else, or on the likelihood that the two will have anything to do with each other. The range is from matrimony or the occupancy of the same home through such stages as another house, street, or neighborhood, to keeping or sending the socially unacceptable ones out of the state, banishing them from the country, or depriving them of life itself.

A more precise scale for measuring a person's attitude toward various racial, religious, and political groups and institutions has been devised by L. L. Thurstone. In constructing an attitude scale a number of varying opinions are collected concerning the group or institution involved. These are arranged by a number of qualified persons in order from the most opposed, through neutral, to the most favorable, by classifying them into twelve groups. After eliminating those which are not well worded, about twenty statements of opinion are then selected which represent the total range and which show the least variability—that is, those about which there is the greatest agreement as to their position on the scale. They are given a scale value according to their average position. The twenty opinions selected are then arranged in random order for the subject to check those with which he is in agreement.

Samples taken from one of the scales, that of the attitude toward war, follow:

War is glorious.

There can be no progress without war.

Defensive war is justified but other wars are not.

War is a futile struggle ending in self-destruction.

There is no conceivable justification for war.

It is clear from these samples that the scale itself takes no stand; but by presenting a wide range of opinions a measure of attitude is obtained. People are usually inclined to agree with a rather wide range of opinions, and so the median of the scale values marked is taken as the indicator of the attitude of the subject toward the group concerned.

It is generally conceded that motion pictures may be influential in changing people's attitudes, but the Thurstone scales provide an instrument for determining whether or not this is so. Groups of high school children, for example, were measured for their attitudes toward the Chinese. Then they were shown a motion picture film which painted the Chinese characters shown in a most favorable light. The next morning they were tested again, with the result that the mean performance moved 1.2 scale points, in a total range of 6 points, toward the favorable end of the scale. Thus, not only can the hitherto elusive attitude be measured, but the instrument is precise enough to record changes in attitude even over a short period. Other propaganda methods could be and have been measured in their effect on attitudes toward other groups.

Sentiment. There is a group of attitudes not at all clearly defined, and about which scientific psychology has as yet very little to say, but which are very important in the life of any individual. These are called sentiments, and may be thought of as emotional dispositions toward objects, people, or abstract ideas. They tend to be consistent in any one individual, but differ widely in different people. Among these is the attitude of self-love, or the self-regarding sentiment, including such assorted sentiments as self-respect, pride, vanity, avarice, and sensuality. Other attitudes classed as senti-

ment are friendship, filial devotion, nostalgia, patriotism, respect for others, and love of sport, or science, or art.

In sentiment, the emotional factor is more important than purely rational considerations. Accompanying the sentiment are various degrees of dislike or hatred for the opposite of the thing around which the sentiment hovers—for example, patricide, enmity, contempt for alien ways, indifference, or cherished ignorance.

INTEREST

Learning and interest. Objects and activities, attention to which is accompanied by a pleasurable feeling or attitude, are referred to as interests. The question at once arises as to whether learning is more rapid as well as more enjoyable if it is made interesting, and whether extrinsic interests—that is, some kind of external rewards—are as effective as intrinsic interest in the task itself. In spite of the vast amount of argument on the subject, only recently has the question been put to experimental test.¹

A group of college students were given a number of such pairs of tasks as the following to learn:

1. (a) The year of birth of sixty celebrities in art, letters, etc. (Average score: 35.8 in fifty minutes)
(b) The year of birth of sixty nonentities, tailors, cobblers, etc. (Average score: 29.4 in fifty minutes. Celebrities/nonentities ratio, 1.22)
2. (a) The true year that each of twenty celebrities was born.
(b) A year in which each of twenty celebrities was *not* born. (True/false ratio, 1.10)
3. (a) The true meaning of each of twenty rare English words.
(b) A meaning which was stated to be one which each of twenty rare English words does *not* mean. (True/false ratio, 1.8)
4. Learning true and false (made-up) biographies of famous persons.
5. Typing correctly, and typing each word with its letters reversed.

The results are briefly given in three of the cases above. In almost every case learning what would supposedly be interesting material produced a higher score than learning useless and hence

¹ E. L. Thorndike, *Adult Interests*, chap. V. Macmillan, 1935.

supposedly uninteresting material. But in only one case was the difference very great, the results for the most part ranging from 10 per cent to 20 per cent higher. The students were motivated by a desire to make a good score in both cases, and in some experiments they were paid by the hour and received a bonus according to the amount they learned. From these experiments one can tentatively conclude that intrinsic interests produce more effective learning, but that uninteresting material, if the learning is well motivated, can be learned almost if not quite as rapidly as interesting material.

Changes with growth. Interests, of course, vary considerably with age. In fact, interests have been taken as a measure of the social maturity of children. One scale ¹ lists such items as the following:

Would you rather dance or play "Puss in the corner"?

Would you rather be a cowboy or a banker?

Would you rather read *The Girl from Rio* or *Our Little French Cousins*?

Is it more fun to have a magic set or a camera?

Would you rather see a movie actress or a giant?

Would you rather think about college life or pirates?

It is not difficult to see in each case which is the more mature interest. Naturally, any child who is markedly below the norm on such a test faces definite adjustmental difficulties.

Vocational interests. Efforts have been made to determine the vocational aptitudes of children and young people by discovering their interests. Lists of occupations have been drawn up on which school children have been asked to check their choices. Over short periods (two or three years) these interests have been found to remain constant in from 30 per cent to 50 per cent of the cases.

Actual vocational choice depends on many factors, such as the influence of relatives and friends, education, economic status, and opportunity, even apart from the fluctuation of childhood interests. Then too, a child may think he wants to be a cowboy but may spend his spare time tinkering with machinery. It is only natural that vocational guidance as determined by vocational interest

¹ P. H. Furfey, "A Revised Scale for Measuring Developmental Age in Boys," *Child Development*, vol. 2 (June, 1931), pp. 102-114.

inventories has been far from effective. Even when case study methods are used, and all interests, spontaneous activities, and special abilities are taken into account, only the large occupational grouping can be predicted with anything like statistical accuracy. In retrospect, a genetic development of vocational interests can often be traced, but in the process of individual development the future choices cannot be satisfactorily predicted.

Avocational interests. The hobbies of children and youth sometimes point in the direction of a desirable future vocational choice. Quite as often, however, they are characteristic only of their stage of development, shifting from year to year. Such variation is desirable, however, not only because of the enjoyment it brings, but also for the reason that different bits of knowledge and skill, social experience and appreciation, are provided. If, after such periods of exploration, definite life interests, avocational or vocational, develop, so much the better.

Youth organizations. Some of the leisure time interests of youth are in certain cases brought together into a pattern of activity in youth organizations. In spite of the wide cultural differences to be found in different countries and the varying religious, political, and non-sectarian auspices of these youth groups, the activities are strikingly similar, indicating a fundamental unity of interest in the majority of young people, whatever their national culture.

Group singing is one of the basic activities in which the youth are interested, and the folk songs of different lands are handed down from one youth generation to another. Physical activity, including hiking, camping, and field sports, constitutes a second great interest of youth; and where it is not a part of a regular educational program, it may be found to be carried on as a revolt or protest against a too confining environmental control. A third interest lies in rhythmic expression in the form of dancing. The folk dances of different nationalities are fundamentally characteristic of the culture from which they spring, and whether frowned on or imitated by the elders, they belong to the youth. A fourth characteristic frequently found in youth organizations is ceremonial. When

ceremonies, including the symbolism of badges and uniforms, an oath, and a ritual, are not provided, they often spring up spontaneously, indicating a kinship of civilized man with the primitive tribes in a desire to give symbolic emotional expression to their feelings of group solidarity.

APPRECIATION

Understanding. Appreciation includes and goes beyond interest, involving as it does a higher degree both of understanding and of emotional enjoyment, as well as a kind of identification of the individual with the thing appreciated. A true understanding of a work of art, for example, is often obtained only after years of familiarity with its complexities and details, requiring long study and experience. One can hardly expect to be able to appreciate an orchestral performance of a symphony without knowing the make-up of an orchestra, the character of the various instruments, and a considerable range of symphonic music, to say nothing of the themes used by the composer in the particular symphony.

The same is true in the appreciation of other works of art, of acts of skill, of the achievements of a great historical character, or of the aims and struggles of a people. Thus knowledge and experience are as important for appreciation as they are for any other educational objective.

Emotional enjoyment. Fortunately one may enjoy without complete understanding and full appreciation. Indeed, if familiarity is so great as to "breed contempt," or if knowledge and understanding lead one to be overcritical, the enjoyment may be thereby decreased. But this is not so likely to happen as is an increased enjoyment because of the greater number of things which may be appreciated.

Such things are not only numerically greater, but the complexities of their interrelationships create numberless patterns of sight and sound and action which have a varied emotional appeal. Even simple curved or jagged lines tend to rouse definite emotional responses; and when to such abstractions as these or musical notes are added the symbols, representations, and movements of other

arts and activities, the richness of the possibilities is seen to be endless.

Empathy. But appreciation is more than knowledge and emotion directed toward an object. It involves also an imaginative identification of the person with it so that he feels himself somehow a part of the story or drama or picture. His strivings, hopes, fears, and loves are there expressed.

Such a feeling of oneself into the situation or artistic portrayal has been called empathy. It need not be particularly aesthetic, as when one finds himself straining empathically when a ball player has to reach for a ball, or when one becomes incensed at the outrages perpetrated by the villain of the melodrama, or when the little boy cries if the bunny rabbit in his animal story comes to a sad end. But the empathic element in appreciation is there, and it may with proper education be developed so that the richness of aesthetic as well as of human experience may be more fully appreciated.

IDEALS AND VALUES

Ideals. Beyond appreciation in complexity are ideals, which involve in addition factors of choice and judgments of value, and even of will and action. An ideal is an object, condition, or mode of action which is chosen by an individual as the most desirable and acceptable. It may be an object of art or a pattern of performance or conduct, and against it others are held for comparison. "This picture does not come up to my ideal of art," a person might say, or "His conduct was far from ideal."

There is the still further possibility that a person will himself endeavor to act in accordance with his ideal. In fact this is usually assumed, although his behavior may in his own judgment and that of others fall far short of his chosen aspiration level. Or his ideal itself may be circumscribed by a narrow social environment and meager or badly controlled childhood experiences. It may even be lower than it need be, actually antisocial, and, if he follows it, detrimental both to himself and to others.

Values. The choice of ideals of conduct rests upon a person's

set of values, upon the kind of thing he regards with esteem and wants above all else to have or to exemplify. To some, money and wealth are the objects of greatest worth which they would sacrifice all to possess; to others, honor and glory; to still others, truth and service.

There is little doubt that experiences determine in larger measure what an individual's set of values will be. The rewards and punishments that he has experienced through the days and years tend to make a person say, "Well, one of the things I have found out about life is that you don't need much of anything else so long as you have——," and here he gives himself away by revealing his judgment of life values.

But it is more than probable that the original nature of man also has much to do with value judgments. Children brought up in the same home often differ widely in this respect, and the choice and enjoyment of a life work depend in large measure on what seem to be basic factors not created by experience, but upon which experience works.

One classification divides men into six types according to their accepted standards of value. These six types are listed below with the corresponding value and a vocation which illustrates each.¹

TABLE VII. TYPES OF MEN ACCORDING TO LIFE VALUES

<i>Type</i>	<i>Value</i>	<i>Illustrative Vocation</i>
cognitive	truth	scientist
economic	utility	business man
aesthetic	beauty	artist
religious	mysticism	clergyman
political	power	dictator
social	service	social worker

No one man is a pure type. For example, a scientist may have much of the economic or aesthetic in his nature. Much less can any occupational group be classified entirely within any single type category.

¹ Eduard Spranger, *Types of Men*. Halle: Niemeyer, 1928.

It is undoubtedly true that some types get on together better than others, however. For example, the economic and the artistic type have little in common, even though there are commercial artists and art patrons, while the cognitive-economic (applied science) and the aesthetic-religious ("beauty of holiness"), to cite but two of the many possible combinations, may have a fundamental harmony of life purpose.

It is perhaps unnecessary to do more than indicate the relation of social institutions to the complex patterns of behavior which have been described in this chapter. In brief, they set up environmental situations sufficiently variegated to provide for a wide range of interests, and seek to uphold in various ways those ideals and values the cultivation of which is for the common good.

QUESTIONS

1. What are some of your pet annoyances? How do you account for them?
2. Check the strength of your aversions and your likes in the items appearing in the tables in this chapter and compare with the averages there given.
3. Have you found that something you did not like to do has become less unpleasant upon repetition? If so, how do you account for the change?
4. Who are the individuals who have prestige so far as you are concerned? Consider the wisdom of accepting their views and attitudes as your own.
5. What kind of work are you so interested in doing that you do not require any extrinsic motivation to keep you going?
6. Think back and plot your major interests beginning with the childhood years up to the present. Can you project the line into the future to indicate your possible occupational choice?
7. What avocational interests do you have? Are they of such a nature that you can enjoy them after graduation?
8. If you are interested, look up some of the literature on youth movements in foreign lands. What possibilities do you see in America for the development of school camps, youth hostels, community shops?
9. In which of the fine arts do you find the greatest enjoyment? What might be done to increase your appreciation of this art? Of other arts?

10. Suppose someone were to give you \$5000 at graduation. What would you do with the money? Does your answer indicate the nature of your life values?

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CHAPTER XVI

LEARNING TO STUDY

Cultural literacy. Those countries where universal education is the exception rather than the rule are faced with many problems arising from adult illiteracy. But a country where the vast majority of the inhabitants can read and write is also not without its problems. Millions of adults who have been to school hardly ever write a letter or read anything but tabloids and pulp magazines.

There are harsh critics of higher education who even contend that the colleges are stocked with individuals who can read and write, to be sure, but who are culturally illiterate. They are either unable to get information from books, or they are not interested. "Educate me if you can!" seems to be their motto, and they leave the college halls profoundly ignorant of themselves and their world and quite incapable of finding any enjoyment in the cultural riches which are of permanent value to mankind, and which the colleges are maintained primarily to foster.

The suggestions in this chapter may help to develop the mental skills which are necessary for the effective attainment of intellectual goals, and an appreciation of what is meant by a love of learning.

CONDITIONS OF EFFECTIVE STUDY

Room conditions. Many individuals are capable of mental work of a high order when suffering from extremes of heat and cold or other bodily discomfort in a poorly lighted and poorly ventilated room, but such conditions are not conducive to effective work, and it requires a tremendous drive as well as a powerful constitution to withstand them for any considerable length of time. Since intellectual work must often be carried on amid handicaps and distractions which cannot be controlled, it increases one's efficiency to eliminate or reduce those which can be regulated. Make it a

habit to give the small amount of attention required to keep the room conditions good: temperature about 68° to 70° Fahrenheit, sufficient moisture or humidity, good ventilation without drafts, and lighting without glare, so arranged that shadows are not thrown on the page one is reading.

Rest and sleep. A full program of studious and social activities is apt to infringe on the time which the body needs for relaxation. Most people need about eight hours of sleep a night, and so often have those who have boasted that they need only six or seven suddenly developed a "nervous breakdown" or some other affliction, more or less serious, that one is hardly wise to take the chance. Rest is essentially a change of activity. Athletes know the sad effects of overtraining and "going stale," and apparently the same kind of thing happens to a greater or less degree in other connections. It is well to mingle manual work, athletic and social activity, or all three with one's studious pursuits, not only for greater happiness but also for greater effectiveness—providing, of course, that matters of major importance are not neglected.

Health and disease. It is impossible here even to outline rules and suggestions for maintaining physical health, including matters of diet and the recently discovered facts concerning allergy or sensitization. For food and exercise, moderation is perhaps the best single guide to follow. Physical defects of eyes, teeth, or other parts should, of course, receive whatever attention modern scientific knowledge can give. Above all, it is unwise to neglect a cold or other disease in mild form no matter how important the events that have to be missed may seem to be. Examinations can be made up, and other people can manage affairs somehow until your return. Every great hospital contains the case records of a sadly large number of patients who would not have needed an operation, or who would have recovered, if they had received medical care in time.

Social distractions. To empty one's room of chatty, socially minded friends without seeming disagreeable requires a tactfulness and skill which needs cultivation, and those who can do it successfully might be observed and their technique studied. Since the visitors should be at their books too, arrangements might be made

to have one of them break up the party occasionally, a large room might be rigidly reserved for study, or house rules might be drawn up and enforced. There are many ways to meet the difficulty.

Time schedule. In most professional occupations a program of appointments must be rather rigidly adhered to. Similarly, many students find that programing their study is helpful in that it enables one to avoid the confusion of suddenly finding that a number of things are to be done, but that there is no time in which to do them. A simple method is to make a table with the days of the week at the head of the vertical columns, and the periods or hours of the day in the vertical rows. Regular class meetings and other appointments can then be written in the appropriate squares. The other squares can contain such items as "study French" or "read history in library." If other squares make provision for sport and recreation, the schedule can be followed quite rigidly, study periods being regarded in the same light as class meetings. Of course, it will be necessary occasionally to deviate from the schedule because of unexpected events. But it is usually better to have a schedule, even though one must depart from it, than not to have a schedule at all.

Emotional balance. With the exception of illness probably nothing interferes with a program of work so effectively as a lack of emotional balance. There are many conditions in life, in college and out, which undermine one's determination and wreck long cherished plans. Perhaps the phrase, "Keep your feet on the ground," suggests what needs to be said on the subject, though such words of advice are often ineffective. Another saying is also apropos: "It is easier to get into trouble than it is to get out of it."

There are always individuals whose capacity for leadership is more to be admired than their judgment. Each person needs to be his own judge as to the kind of leadership he will maintain or follow. Opportunities for cool judgment occur frequently in such matters as mob enthusiasm for athletic teams, sadistic initiatory rites, excess in college "activities," attendance at motion pictures, playing parlor games, or having crushes or love affairs. One cannot expect to exercise his best judgment in every case, but one can

manage his life if he will, and it is gratifying to realize that those who do, seem to be rewarded by enviable satisfactions.

MEMORIZING

Selection. "Learning by heart" does not now play so large a part in education as at other times in history. There are many occasions, however, when a word-for-word mastery of verbal materials is desirable and even necessary. The student, for the most part, is left to select the items to be thus memorized himself. If he finds the task easy, he may wish to learn a considerable amount of literature that appeals to him. If the process is difficult, he will probably prefer to memorize very little.

In any case, his lines in a play, or "declamation," or the points in a speech, as well as word meanings and inflections of a foreign language, are on the "must" list. A few key dates in history should probably be added, some definitions, *if their meaning is understood*, technical terms, and probably the outline of main points of significant sections of a course of study. If it is recognized that certain parts should be memorized, the task, if intelligently done, is not particularly difficult. The advantages of mastery need hardly be emphasized.

Whole and part learning. A good many experimental studies have been made to determine whether it is better to go over a part of a passage to be learned—say a single stanza—again and again until it is learned before taking up the next, which is repeated the same way, and so on, or whether more efficient learning takes place when the learner goes over the whole passage. The former method illustrates integration, in which completed parts are fitted together to form a whole. The latter method illustrates individuation, in which the parts grow and become differentiated with the development of the whole.

There is much to be said in favor of the latter or whole method. It works better in practice because the parts are connected in their proper order and arrangement; whereas, in the part method, the end of one stanza will be connected with the beginning of the same stanza, because that was the way it was frequently repeated. Then,

too, a part means what it does in context because of its relationship with the rest. If it is learned that way, meaningful connections are made which are helpful both in remembering and in interpretation.

If the whole method is used, however, it is wise to give added attention to the passages which for one reason or another are not learned so readily as the rest. These may be gone over a few times and then practiced again as parts of the whole selection.

Parts tend to be recalled in the context in which they are learned. This is what is desired in many cases, but in others it is not. For example, many who learned the multiplication table cannot tell what 6 times 9 is without starting at the beginning of the table and working up to it—which slows their computational skill considerably! Similarly, grammatical inflections and rules for prepositions which govern the dative, and the like, are often tied to their logical or formal position, and so are not ready for use in speaking or even reading. Hence the whole method involves practicing such segments in their proper language relationships. Even though this necessitates saying certain phrases over and over again with varied inflected parts, the practice is well worth the time spent, giving as it does a mastery which cannot be obtained by practicing the parts out of context.

Overlearning and review. No doubt everyone has discovered for himself that if he brings a passage to the point where he can say it correctly, he has little assurance that he will be able to repeat it correctly the following day. This applies equally to repeating prose or verse, and to such items as telephone numbers and people's names. It is not an individual weakness or a sign of a "poor memory," but a characteristic of the human mind. If one desires to learn with the assurance of anything approaching permanence, overlearning is necessary. Overlearning is continuing the learning process beyond the point of one correct repetition. One can easily drill himself on the thing to be memorized a few times if he realizes that it is a necessary part of the process, and that it will help materially in retention.

It may be observed that suggestions for effective learning are

really applications of the principles previously described. Thus perfect retention depends not only on overlearning but also on subsequent repetitions or reviews. In general, the longer the interval between such review periods, the longer the time needed to bring the material up to perfect recall; but the time taken to recall is shorter than that needed for the initial learning. Hence any cramming is less delirious if one has once known the material that for one reason or another needs to be brought up to a level of perfection.

The method of recall. In the process of memorizing, some merely read over again and again the passage to be learned, until it is memorized. This is a rather slow and tiresome process, however. More effective is the so-called method of recall. This involves actually saying over from memory as much as is learned, and trying to recall "what comes next," before looking to see.

In addition to its increased effectiveness, this method provides a measure of learning, for by recording the number of "looks" or self-promptings it is possible to record the effectiveness of each repetition and hence the process of mastery. The same method is likewise more effective in subsequent review periods.

ASSOCIATIVE LEARNING

Retention factors. Much that has been said above concerning memorizing applies equally well to learning in which the exact words need not be recalled, but only the ideas, couched in whatever words may adequately express them. It is desirable and necessary to select the important ideas, those which for one reason or another are of greatest significance. Whole learning is effective for this purpose, for going over a whole chapter or section reveals the interrelations of its parts, the main and subordinate ideas, and the way in which the author develops them. Overlearning is also necessary, though some hopeful students seem to think that if they have "read over" a passage their duty is done, when they perhaps cannot tell a thing that is in it right after they have read it. There is nothing but drudgery and dissatisfaction in such a pitiful effort, none of the joy of mastery. By using the method of

recall at various intervals, thinking through an idea after one has once read an author's presentation of it, one finds himself in possession of it far more quickly than when he merely reads passively. After the idea has once been acquired, reviewing is necessary, but it can be very rapid and still be effective.

Subordination. In associative learning probably the most important of all the foregoing points is the discovery of the relative significance of the parts of what one reads. Certain ideas are presented, illustrated, amplified, and their implications and applications shown. Which are the main ideas, and which the supporting data? When first attacking a relatively unfamiliar field of knowledge, it is not always easy to decide. Students sometimes mistake an illustration for the main idea, or a corollary for the general principle. If one is on the lookout, however, there are many signs to help, not only in the typography but also in the writing itself.

If one is taking notes on a lecture or a chapter, the outline form is desirable, for the reason that it emphasizes this matter of subordination. To get the right relationships from oral discourse, however, is often difficult, because the presentation of ideas is continuous and there is little time for thinking the matter over. It is therefore a great help to check back over one's lecture notes as soon as possible and insert letters, numerals, and other marks to show which are the coördinate and which the subordinate items, while the whole is still fresh in mind.

Many students find that a system of underlining is helpful both at the time one is reading, to aid in comprehension, and also later, for purposes of review.

Logical connections. There are a number of logical connections which, if they are noted in reading, make comprehension easier and retention more complete. Perhaps the most important of these is the cause-and-effect relationship. A cause is a condition without which a subsequent event would not or could not occur. In this category we may conveniently include the antecedent and immediate conditions leading up to a war, a treaty, or a compromise; economic and social conditions eventuating in riots, enact-

ments, or new policies, and the like; and psychological factors to be found in the nature and characteristics of kings and other leaders.

Besides the social sciences, from which the above illustrations are drawn, causative factors are significant in the natural sciences, in the formation of inflected languages, and in the arts. They are answers to the question, Why? And though the answers are never complete, the necessary conditions under which certain objects or events are found are often rather fully known.

Another important relationship is the temporal one, the answer to the question, When? Perhaps a date will be the best means of placing an event in its proper sequence, perhaps a ruler's name, or maybe a mention of what occurred before or after. Similar is the spatial relationship, the answer to the question, Where? According to the data the place may be in a certain country, a layer of rock, or at the bottom of a pool. The time and place orientation is important to get, and attention to such details often makes the recall of the whole pattern of events easier and better.

Speed of reading. Expository writing is apt to be condensed. It necessitates slow and careful reading, especially if one wishes to understand and remember what is read. An article in an encyclopedia, for example, reads more slowly than a novel. But one does not read all the articles in an encyclopedia. Selective reading is necessary, there as elsewhere, picking out and noting the items one wants and skimming rapidly over the rest. Often whole sections of a book either are not of interest at the moment, or are sufficiently familiar so that a review of chapter or section heads is enough for one's purposes. To wade through the discussion would be a waste of time.

Most persons, however, ordinarily read much more slowly than is necessary. More rapid reading can be developed with practice if the individual wishes to push himself, and attend carefully to the meaning as he does so.

Supplementing and criticizing. The suggestions given thus far to aid in associative learning seem to imply that it is entirely an absorption and reproduction process. This is largely the case in the

earlier stages of the mastery of a field of knowledge. But it is never too early to contribute something. Illustrations other than those given by the author can be imaginatively inserted as one reads, as well as additional considerations, and perhaps other related facts gained from reading elsewhere on the same subject.

Also, it is never too early to read critically. Are the author's deductions sound? Is his advice good? What sources does he use? From what point of view does he examine his data to find the interpretations he presents? What other points of view and other interpretations are there? Is he trying to make a case? To sell something? If so, why?

Such questions as these may well be brought to bear instead of the uncritical acceptance with which most textbook pronouncements—like most advertisements—are received. It may be well to familiarize oneself with the facts and to get the author's point of view; but suggestion and criticism make study an activity of a living intellect instead of that of a shovel or a sponge.

Application. Just as number combinations and foreign language forms need to be separated from tables and conjugations to be used, so do the ideas presented in systematic form in books need to be made available for use in connection with new ideas and life problems. The amount of transfer apparently depends upon the extent to which an individual can see in current phenomena applications of general principles with which he has previously acquainted himself. A formula, rule, or principle is dry and uninteresting only to him who perhaps memorizes it to repeat on an examination and who does not see its implications either in its context or in the life around him.

What similarities does one find in a Roman agrarian revolt and in the farm problem at home or the development of coöperatives? How does the principle that a privilege which is not exercised tends to disappear apply in local government? To what extent are the generalizations concerning effective study outlined in this chapter applicable to one's own scholastic difficulties? If such questions are constantly rising and the answers are conscientiously sought, it will be found that the subject-matter practically learns itself,

the mind is given a chance, and the cultivation of the intellect becomes a delight.

WRITING

Scholarship and research. One form of academic work which is a part of the occupational activity of the upper intelligence brackets is writing. College courses in English composition often emphasize the personal essay as a form of artistic self-expression to the exclusion of expository writing, the aim of which is clarity. The informed reader of the rules of a game, or the directions for cultivating a garden, or the recent discoveries concerning vitamins or cosmic rays is not particularly interested in a revelation of the writer's inner life. He wants the thing explained so that he can understand it. Popular writing for the uninformed public may need to bring in picturesque and superfluous details to keep the reader interested, but the interest of the informed reader is in the material itself.

There are a number of common practices and conventions in scholarly and scientific writing which simplify the task both for the writer and the reader, but which conform to general rhetorical principles. Some of these will be briefly discussed with the hope that the techniques suggested, if not already acquired, will aid in the development of writing skill.

The problem. Any scholarly or scientific writing, be it article, monograph, or book, has some main theme, some single idea which is developed, expounded, supported, or illustrated. It makes a point. It describes something that has been found out. It is therefore necessarily delimited, as a textbook, which tries to tell the main things about almost everything in a field, is not.

One would not write a paper or report a research on *The Growth of the Child*, or *American Education*, or even *Juvenile Delinquency*. To discuss such broad subjects adequately would require a volume or two, and to restrict them to the scope of a paper results in a series of unsupported generalizations and platitudes. The following are a few samples of problems or topics, in each of the fields mentioned above, which might be adequately treated in a monograph or article:

The Growth of the Child

1. The development of locomotion
2. The development of coördinated movement during the first year
3. Improvement in reading during the elementary school
4. Perceptual disabilities and remedial reading
5. The play interests of later childhood

American Education

1. The college records of students from private and from public schools
2. A comparison of performance in arithmetic of rural children in one-room and consolidated schools
3. The effect of type of test on student study
4. Vocational courses in Northern and Southern States
5. Marking systems in American colleges

Juvenile Delinquency

1. The relation of truancy to subsequent delinquencies
2. Emotional factors in certain school problem cases
3. The intelligence of juvenile delinquents
4. Socio-economic status and juvenile theft
5. The contribution of the school to delinquent tendencies

Such delimitation does not imply that the writer should not read widely, but only that it is not necessary to write everything he reads. He will select such data and points of view as will develop the point he wishes to make.

Bibliography. In research it is necessary to go to primary sources, to original manuscripts and records, and first-hand observations and experimental findings. Otherwise, secondary sources are satisfactory, and must be sought in available books, monographs, and journals. General references such as the *Readers Guide to Periodical Literature* and the *United States Catalog* are indispensable, though most departments have bulletins or abstracts which systematically present reference material. Often bibliographies at the close of textbook chapters make a good starting point.

In compiling a bibliography, it is convenient to record complete references in proper form on 4 x 6 cards upon which the notes desired can be made when the reference is found. Page references should be given, and all quoted material inserted for support of a

point, or illustration of a point of view, should be inclosed in quotation marks.

Form. Due attention should be given to proper grammatical and rhetorical form in writing, and to the conventional manner of presenting tabular material as well as bibliographical references. While a paper must rest for its authority upon the data cited, there is opportunity for originality in the methods used in collecting the data, in presentation, illustration, and interpretation. While most college papers have served their purpose when the writer has completed them, occasionally they might be developed with a view to publication. A review of the articles and studies appearing in different kinds of journals will give an idea of what is acceptable for publication. Much appears in print that might better have awaited further verification; still, originality in outlook and new data, techniques, or interpretations are ever sought.

QUESTIONS

1. Make a checklist of the suggestions for more effective study given in this chapter. Check those which you believe need your attention, and indicate ways in which improvement can be made.
2. List any suggestions you may have found useful which do not appear in this chapter.
3. Effective study means the same results in less time, or more satisfactory results in the same time. Discuss.
4. What evidences of cultural illiteracy do you observe in the life of your college, if any?
5. It has been said that when parents have been to a late party, their children are likely to be naughty the next day. When you have not had enough sleep, what symptoms do you notice in yourself? What symptoms in others when they have not had enough sleep?
6. How much time which yields you neither pleasure nor profit do you spend in a day? What can you do about it?
7. Are you sensitized to any foods? What are some of the symptoms which suggest the presence of an allergic condition?
8. What suggestions to eliminate social interference in study occur to you? Can group discussions be profitable?
9. If you are interested in doing so, keep a systematic record of the

way you spend every hour of a more or less typical week. On the basis of these data, what revisions in your schedule do you think to be advisable?

10. Compare the way of life of someone whom you consider emotionally stable with one who seems somewhat unstable. What are the characteristics that make for proper balance in the former?
11. Do you know any students who take their college work seriously but who are not "grinds"? What is their secret?
12. Show where the principles of frequency and recency are discussed or implied in this chapter.
13. In what ways do (a) typography, and (b) connecting words indicate logical relationships? Illustrate.
14. What part of this course would you be interested in exploring farther? In what phase of some other subject-matter field do you find yourself most interested?

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CHAPTER XVII

PROBLEM-SOLVING AND CREATIVE LEARNING

Learning and creating. Thus far, the process of learning might be thought to be almost wholly one of recalling words that others have written, or of performing skills which others have acquired. By far the greater amount of learning is just this. Induction into the cultural heritage involves the acquisition of the knowledge and skill which it is necessary and pleasant to possess. Certainly it is easier to learn to read than to invent an alphabet; to locate America on the map than to discover it; to drive a car than to invent even a single gadget; and one can usually find greater joy in a picture or a poem that an artist has created than in any he himself can produce.

Yet, in countless ways, an individual is called upon to meet difficulties, to discover solutions, invent new ways of doing things, and even to engage in creative activity. True, the knowledge and skill he has acquired are necessarily employed; but to be useful, they must operate in ways which are different from any he has been accustomed to. And the answer is not to be found in the back of the book. While the occasions for such inventive or creative work are rare for most people, success or failure with respect to them is often much more important to life and happiness than a score of facts or skills.

TRIAL AND ERROR

Conditions of learning. In Chapter XIII the fundamental factors of learning were briefly set forth. They apply to the total learning process, and hence to that phase of it which can be called problem-solving. The basic plasticity of the organism, which makes multiple response and piecemeal activity possible, is supported by

some basic drive. The situation or field is such that obstruction is offered: the stimuli to which the individual responds are not the ones that should be responded to, or the response made is the wrong one for the satisfaction of the drive. If certain other stimuli become prepotent, or certain other responses are made, the obstruction is removed, the reward obtained, the problem solved.

Human problems. To catalogue even the most frequently recurring human problems would be a well-nigh hopeless task, but a few may perhaps be suggested. There are, for example, the problems which center about educational and vocational choice: what college to attend, if any, what courses to pursue, when to study, what books to read, what training to take, what vocation to pursue, what job to apply for, and what recommendations to seek.

Then there are the problems of one's occupation, which differ for every individual and for every calling: what friends to cultivate, what letters to write, what to say in them, how to deal with this buyer, that officer of the firm, this parent, that creditor, and so on, ad infinitum.

Financial problems are often very pressing—matters of investment, budgeting, and the like.

The important problem of selecting a suitable mate seems to cause many conflicts and result in many errors, but is often no more difficult than that of getting on with the mate selected. Marital troubles seem to be more often caused by an incapacity to solve simple problems than by any basic incompatibility. Many problems arise in connection with the rearing of children. Unless they are satisfactorily met, they result in unhappiness, discord, and sometimes stark tragedy.

It must not be supposed that such problems as those suggested above render life unpleasant. Just as no one person has all the diseases to be found in a hospital, so no one individual makes all the mistakes to be found in the files of the mental hygiene clinic or the family welfare bureau. Fortunately, too, important problems do not all have to be met the same day, but they scatter along life's pathway and add zest and interest to its routine.

Anecdotes and observations. It should be confessed at the outset that psychological knowledge concerning the exact nature of the problem-solving mechanism is still meager. However, important conditions relating to the process are known, which, if they could be widely enough disseminated, would considerably reduce the amount of human misery in the world, and add markedly to human happiness.

The knowledge which has been attained has been painstakingly collected for many years, though the time in which scientific means have been employed is short when compared with the history of the natural sciences. The observations of Aristotle were followed by centuries of devotion to his pronouncements. Armchair accounts of the thinking processes have been given by philosophers whose life problems were not always met according to their formulas.

During the second half of the past century anecdotes illustrating the instinctive wisdom and sagacity of animals were collected, though the events, often reported second- or third-hand, were none too well substantiated. Observations of insect, animal, and child behavior have also been carefully noted and assembled; but here too, though the person who made the observation also made the report, important factors were often not noticed, and the interpreter was sometimes warped by personal prejudice.

Mazes and puzzle boxes. It was not until just before the turn of the century, with the invention of the animal maze and the puzzle box, that controlled experimentation on the process of problem-solving began. A maze is a series of pathways many of which lead to blind alleys; but if the subject makes the correct turns all along the way—that is, if he follows the “true path”—he will reach his goal, which, for the white rat, is usually a bowl of bread and milk. The puzzle box is a kind of cage, the door to which may be opened if the subject presses the right levers or pulls the right strings. Cats were first used in this kind of apparatus, their reward being a piece of fish or liver placed outside, although sometimes the problem was to get inside the box to get the food. Pencil mazes have been designed for human subjects who follow grooves with the point of a pencil or a stylus while blindfolded; and puzzle

boxes, designed for human subjects, have been devised which are opened by a complicated series of levers.

Explanations of trial-and-error learning. The observation of experimental animals under controlled conditions did much to banish the misinformation concerning animal nature. But the explanations of the earlier results were somewhat oversimplified. It was said that the animal made to his maze or puzzle box environment whatever responses he was able to make. Those responses which resulted in pleasure—that is, in obtaining freedom or food—tended to be repeated, while those resulting in unpleasantness—that is, in continued confinement—were gradually eliminated.

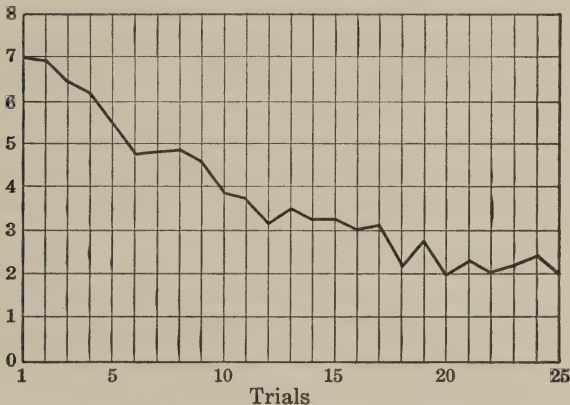


Fig. 33. THE CURVE OF LEARNING ¹

In this curve showing the average performance, for successive trials, of a group of rats learning a maze, the improvement is shown in the reduced number of errors, on times the rats entered blind alleys. (After Heron)

The curve of learning (Fig. 33) was drawn with the time or errors on the vertical axis and the trials on the horizontal axis, giving a graphical representation of the way in which problems were solved. Human thought processes were considered as "mental trial and error," in which the individual tried out various solutions

¹ E. B. Greene, "The Retention of Information Learned in College Courses," *Journal of Educational Research*, vol. 24 (December, 1931).

in imaginal terms and finally adopted the solution accepted as successful. As a description of what sometimes happens in certain types of situations in which it is impossible to see the outcome of various trials before they are made (as in the maze and puzzle box), this explanation is fairly satisfactory. But as a complete interpretation of the problem-solving process, it has proved to be quite inadequate.

INSIGHT

Detour experiments. A new direction to the investigation of problem-solving was started by Wolfgang Köhler, who, during the second decade of the present century, on the island of Teneriffe in the Canary Islands, performed experiments using chimpanzees as subjects. These experiments were less complex than those employing the maze and puzzle box. They were so arranged that the animal could get an overview of the whole situation, and by a single relatively simple act obtain the coveted chimpanzee lure, a banana.

In one experiment, the animal was placed in his accustomed cage with the lure outside, beyond his reach, but with a stick in the cage which he could use to hook the banana toward him to a point where he could reach it through the bars. In another experiment there was no stick, but a crate occasionally used by the keeper as a seat, from which a slat could be torn and used as a stick to retrieve the lure.

In another series of experiments, the banana was hung outside, above the chimpanzee's reach; but in some cases a pole was placed nearby with which he could knock it down; and in others, boxes were used which he could move over and climb up on, or pile high enough to obtain his reward.

In these and other experiments which Köhler describes, it is clear that there is little or no random trial-and-error behavior. The animal is at first blocked by the obstruction in his field. He may wander over to a corner and sit down, he may pace back and forth, he may perch on a bar and scratch his head. But of a sudden he hops up, turns away from the lure to get the stick, slat, or box, as the case may be, comes back with it, and uses it to obtain the

banana. Once the problem is solved, there are no errors, except possibly minor ones in manipulation. The time he takes is no accurate measure of the extent of his success, for much time may intervene in which he is not working on the problem at all.

Such detour experiments, as they are called because the subject has to go around, away from, and back toward the lure, have been arranged for other subjects than chimpanzees—other animals, children, and adults. A dog seeing meat outside the window will go around by way of the door to get it; or when it is on the other side of a wire fence, he will, if possible, find a way around the obstruction or barrier. A child will do the same thing. In fact, practically all the chimpanzee experiments have been tried out on small children with very similar results.

Somewhat more complicated experiments have been devised for adults. In a room with a comparatively low ceiling, college students acting as subjects have been shown a clamp and a couple of sticks, each about three-quarters the height of the room, and told to make a hat rack of them. Futile efforts to construct a tripod with two legs were eventually given up. The experimenter might then give a hint to give direction to their efforts perhaps by bracing one stick horizontally between the table and the wall. When the solution came, it came all at once. The two sticks were brought together and braced vertically, the end of one against the ceiling, the end of the other against the floor, and clamped together. The hat was hung on the screw of the clamp.

Again, the hanging ends of two strings attached to the ceiling were to be tied together. But they were too far apart to reach both of them at once. To furnish direction, the experimenter casually walked past one, which caught on his shoulder and was left swaying a little. A pendulum! The subject then attached a little weight to one string, started it swinging, took hold of the other, caught the pendulum string when it swung toward him, and tied the two together.

Prepotency and cues. Köhler and others have shown that even some of the curves of learning obtained by Thorndike and others, supposedly illustrating trial-and-error learning, show a sudden

drop (Fig. 34) indicating that for one reason or another the animal got the solution quickly. One experimenter was somewhat dismayed to see a kitten, placed in a puzzle box for the first time, sit down, look around a little, then walk over to the "latch string," pull it, thus opening the door of the box, and walk out.

In this case the prepotent stimulus called out the right response the first time. We cannot say whether the kitten was surprised by his success or not. With a change in the latch apparatus, how-

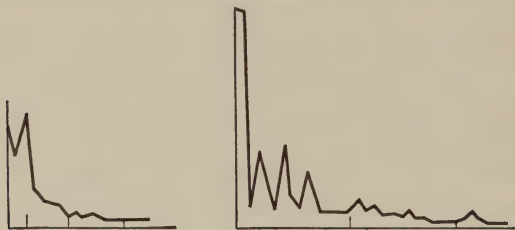


FIG. 34. CURVES SHOWING A RAPID DROP

Success is measured in the amount of time taken by two chicks in escaping from simple mazes. (After Thorndike)

ever, he was not so successful. In the chimpanzee experiments, the crate in one situation is something for the keeper to sit on, in another something to pull a slat from, and in a third something to move about under a banana to climb on or perhaps to pile upon another crate or box. The same object is not always the cue for the same activity. The total pattern of the situation determines what is the appropriate response. As has been so often said, "Circumstances alter cases."

The whole and the part. This familiar and important relationship of elements and their context has been systematically set forth by the so-called Gestalt school of psychology. *Gestalt* is a German word which means about the same thing as *form* in English. It has been translated *arrangement*, *pattern*, and *configuration*.

Among others, two Gestalt formulations are important: the law of field properties, and the law of derived properties. The law of field properties may be stated as follows: The whole is more than the sum of its parts. The whole, of course, includes both the parts

and their arrangement or pattern. Thus four parallel lines are different from the same four lines arranged as a square. Lines that form a figure, notes that form a melody, letters that form a word, are by themselves less than the pattern or whole which they constitute.

The law of derived properties may be stated as follows: The parts derive their properties from the whole. A line or a note or a letter is what it is according to the pattern of which it is a part. Similarly the crate is what it is according to the pattern of the situation which the chimpanzee and the banana are in. To climb on the crate in order to obtain the lure on the ground outside the cage would evidence a complete confusion of patterns, though with the suspended lure outside, such a response to the same crate would be successful.

Similarly in the adult experiments previously described, the two sticks and the clamp must be taken out of the tripod pattern and made into a different one; and the hanging string and the weight on the table must get together to make a pendulum pattern.

Patterns, objectives, and standards. The word *pattern* usually applies to two-dimensional spatial arrangements such as a checker-board, or a geometric or artistic design on paper or perhaps on a carpet. It may, of course, be three-dimensional as in sculpture or architecture. But it may likewise be temporal, as in the case of a rhythm or a melody. It is therefore not difficult to go one step further and think of a pattern as being both spatial and temporal, as, for example, in the case of the figures of a dance or the action of a play, when movement is a part of the design. It is in this sense that the term "behavior pattern" is employed.

In the case of problem-solving and other creative experience, the pattern is extended temporally to include action which has not taken place. This must be so since the response to a particular object is what it is because it will lead to a certain fulfillment, a completion of the pattern. A dance step or a football play when half-completed has brought the participants to a certain position only because they must be in those positions in order to round out and to complete the step or the play. This is what was meant by

the statement in Chapter XIII to the effect that learning is influenced by the future.

In the case of problem-solving and creative work generally, the form of the space-time pattern is incomplete. It may be completed in various ways, perhaps, but only one way satisfies certain norms or standards which have been built up in respect to balance or proportion of the whole.

One of these norms is efficiency. There cannot be too long a temporal prolongation of the pattern. Thus we should not regard it as a solution if the chimpanzee waited under the banana until the string that held it rotted and broke.

In human activity, considerations of truth or falsity, of right or wrong, of beauty or ugliness, are important in the completion of patterns. The criteria of such considerations are systematized as the "normative sciences" of logic, ethics, and aesthetics respectively. Conclusions (solutions) are described as true or false, actions as right or wrong, creations as beautiful or ugly, according as the patterns harmonize with the gradually changing standards by which they may be judged.

PROBLEM-SOLVING

Learning to think. While the importance of specific knowledge and skills, particularly in connection with one's vocation, cannot be questioned, there is supposedly a value in thorough mental work apart from the particular pieces of information which one may remember or forget. This valuable residue of an education has been defined variously in terms of mental discipline and of transfer, and is sometimes referred to as "learning to think."

The nature of the thought process is gradually becoming clearer, as a result of the experimental studies which are being made, some of which have been briefly described. It remains to consider what are the characteristics of thinking which operate in various situations and which, if applied to a new situation, will make the whole process of problem-solving more useful and effective.

Experience. The first essential in successful problem-solving would seem to be experience. A person who has had experience

with automobiles, with children, in business, or in industry would supposedly be more competent to deal with problems arising in his particular field than anyone who has not had similar experience. Many of the situations which would present problems to the inexperienced would be dealt with by the experienced as a matter of routine, in ways that have been acquired by practice. Furthermore, the experienced person knows the kinds of problems that may arise, and the kinds of solutions which have been effective at other times. He does not hesitate or experiment, but tries the familiar solutions with considerable assurance that they will work effectively. It is a case of selecting from preformed patterns the one which has been shown to fit.

However, there are sometimes disadvantages in experience. The preformed patterns may have worked well enough once, or in one place, but the experienced person may not realize that times have changed, or that a new environment demands a modification which he is not able to offer. Thus a teacher who may have been successful in the use of harsh and dictatorial methods in one school might actually be disqualified for useful service in a more progressive institution. A woman who is a social leader in one type of community might find herself ostracized in another. A salesman who had developed a successful technique might be helpless in selling a different article in another part of the country. The circumstances are different; hence the pattern must be completed in another way.

The field. Whether one has had experience or not, a primary necessity in problem-solving is to define the problem or analyze the situation. This involves a discovery of the field of related phenomena. What are the objects or relationships which do or might have a bearing on the situation? A cat or chimpanzee might chew at the bars of the puzzle box or cage, or an adult might pull a lever at random, make a speech, or fly into a rage—actions which would not help in the least to solve the problem of getting out of the box.

Sometimes there are obscure elements in the situation that it will be necessary to bring into the pattern before the solution can appear. If a person is completely baffled and can think of no way

out of the difficulty, there are two things he can do. One is to consult others who might help him. This is a most sensible thing to do to save time and avoid wear and tear. However, the suggestions offered should not be acted upon without due consideration. The other is to attend to parts of the total situation one at a time, allowing associations to arise and so discover what is known about the various aspects of the problem. Thus a hanging string, which is at first perceived as just a piece of string, may come to be seen as a part of a pendulum, which has certain definite characteristics.

Intuition and hypothesis. When a possible solution is discovered—that is, when certain aspects become related in the form of a pattern to be completed—the individual is said to have insight into the situation. Such insights are easy for some people, and they are sometimes given the name intuition.

An intuition may offer a correct solution, but it is really little more than a “hunch,” which may or may not be tenable. If one wanted to anthropomorphize, to ascribe human characteristics to animals, he could say that the chimpanzee intuitively realized that the way to get the banana was to climb up on the box. But one of the chimps did this, neglecting, however, first to push the box under the banana. The pattern was somewhat awry.

When an intuition or hunch is set up as a proposition to be established or refuted by scientific investigation, it is called a hypothesis.

Consequences. A hunch, insight, tentative solution, or intuition. call it what you will, needs verification. Will it work? Sometimes the only thing to do is to try it out and see. However, if this involves considerable time and effort, and perhaps the coöperation of others, it is wiser to consider step by step what the consequences would be. Would the proposed solution, if it worked, really obtain the objective sought? Would the possible advantages to be obtained be worth the cost? What would be the attitude of others? What support might one have in the undertaking? What social or ethical considerations are involved? Might the proposed solution create more serious problems?

There might be consequences so unfortunate as to bring to naught any possible advantage to be gained. A prisoner sometimes con-

trives to escape from prison a few days before the expiration of his sentence, and thereby renders himself liable to further imprisonment. One may win an argument or a game by dishonest means, or get a laugh and lose a friend. The problem of poverty is not solved by individual acts of charity, which are as likely as not to develop professional paupers; and a school discipline which seems to be successful may build up hatred and resentment more harmful than the outward-appearing orderliness is advantageous.

Generalizations. When a particular problem is solved, there is a tendency to apply the solution more generally. In fact, scientific principles and laws are generalizations concerning the nature of the world. The process of deriving generalizations from specific instances is called induction. If a certain proposition is true of a representative sample of cases, one may conclude that it is true of all such cases.

It may readily be seen that there is great danger in making generalizations too easily, on the basis of too few cases. Thus, one might reason that if a dozen pieces of iron float, all iron floats; or that if the average intelligence of one hundred college freshmen is 110, then the average intelligence of all college freshmen is 110. Such generalizations would not be valid, because they are based on insufficient data. Often a generalization is held to with great tenacity on the basis of a minimum of evidence to support it. One frequently hears startling statements concerning the nature of certain national, economic, religious, or other groups when it may be that the speaker has never seen half a dozen representatives of the group in question. Such a judgment is called a stereotype. The stereotype judgment is based on too slight evidence to be dependable, is not readily modified, and yet may be the basis of attitudes and actions exerting considerable influence upon an individual's conduct.

A superstition is a similar phenomenon, a belief concerning natural consequences, held by groups of people, but not substantiated by available evidence. It is more than probable that one's Uncle John, who did not have rheumatism, would not have had it even if he had not carried a horse chestnut in his pocket.

Stereotypes and superstitions evidence what might be called a stage of arrested development in concept formation. A concept is an abstraction. It is made up of the characteristics of certain objects or events based upon the experience one has had with them. A person's concept of roughness, of distance, of kindliness, or of beauty is what each of these words means to him. Thus judgments of particular persons or things are made on the basis of perhaps very limited experience.

Some concepts are acquired early in life; others must be built up somewhat painstakingly—for example, that of democracy, ionization, relativity, or Gestalt. Technical terms have exact meanings which may be acquired; others are apt to be somewhat vague or ambiguous, with the result that disagreements and disputes may arise over their interpretation. This is true in the case of such an abstract quality, for example, as justice.

The scientific attitude. Scientific research involves the development of detailed techniques for the more exact observation and control of the data being investigated. In conducting such research, what is called a scientific attitude is properly maintained. But a scientific attitude need not be confined to scientific investigation; in fact, it is a desirable one to have when confronted by any problem.

The scientific attitude is *objective* with respect to data. As many facts are collected as may be needed, they are observed carefully, relationships are considered, and matters are brought into full view, as it were, so that they can be seen by other observers as clearly and in the same relationships as they are seen by oneself.

The scientific attitude is *unbiased* in that personal prejudices are not allowed to influence the selection of data or conclusions derived from them. A scientist may properly favor a particular hypothesis, but he should always be ready to modify or discard it when he discovers facts that do not support it. Some men of science have been known to cling to their beliefs in spite of an array of evidence against them, though in doing so they have not exemplified the scientific attitude. Often the wisest thing to do, when confronted with a particular problem, is to endeavor to overcome one's natural but unreasonable prejudices with respect to kinds of work,

groups of people, relatives, friends, or oneself, and face the circumstances more nearly as they really are, or at least from a different point of view.

The scientific attitude is *cautious* with respect to generalizations, basing conclusions only on sufficient data. In practical situations it is often not possible to have all the data one could wish, in which case it may be necessary to go ahead anyway. But a tentative acceptance and sufficient flexibility with respect to change may prevent a too long adherence to untenable conclusions or discredited ways.

The scientific attitude is *critical* of assumptions and of conclusions. In a world where unreason, special pleading, propaganda, and pressure groups stalk abroad, one is wise to ask at least occasionally, "How do you know? What makes you think so?" or "What evidence is there for that statement?" Pronouncements which sound authoritative, even some made by scientists in fields in which they are not particularly qualified to speak, may be utter rubbish. Science is empirical, and even an authority must present his evidence, which must be something beside just another authority.

The scientific attitude, lastly, is *inquiring* and *creative*. One seeks to know and to find out why; and in formulating tentative answers in this enduring quest for truth, new techniques are invented and tentative answers, solutions, and generalizations are formulated and many thrown aside, always to be replaced by others. The partial patterns have to be completed, and each completed pattern turns out to be but a part of patterns still to be completed. And so the quest goes on.

ARTISTIC CREATION

Standards of art. Solutions of problems are judged by the standard of truth or fact, works of art by their psychological appeal. Every period has its characteristic literature, music, and paintings. Conventions relating to subjects, harmonies, or colors are built up. Artists follow these conventions for a time until some of them feel that the beauty they wish to express demands other forms. They become heretics and are often denounced or neglected; yet if what

they have created later makes a psychological appeal to art lovers and to people generally, they may be posthumously sanctified. Whitman in literature, Wagner in music, and Van Gogh in painting illustrate this peculiar phenomenon.

Empathy. Nothing in the realm of psychology is more obscure than the creative process in art. It is easy to say that the poem or sonata or landscape embodies a number of experiences of the artist, many of them identifiable, but arranged in new patterns of meaning, cadence, rhythm, or light and shade.

Mere rearrangement of patterns, however, even in new forms, does not constitute creative art. The completed work must mean something important to those who read or hear or see it. It must be an expression of the feeling and emotion of the artist into which one may enter, as it were, imaginatively and so catch something of the same feeling. This imaginative identification of the observer with what is observed, which is called empathy, has been mentioned in connection with the discussion of appreciation. When a work of art does not produce this feeling, the observer may say, "It leaves me cold," or "It doesn't mean a thing to me."

Besides creating a feeling of empathy, a work of art, to be truly great, must express feelings which are recognized as fundamentally important, as having a universal significance. They must be genuine and true, not superficial or distorted.

Imagination. The psychological process involved in creation may be considered as somewhat distinct from the quality of the product as judged by varying standards and conventions. Artistic creation involves a knowledge of the techniques of the art, which may be acquired gradually; too early emphasis on the techniques is apt to submerge any creative feeling that may be present. It involves a knowledge and appreciation of the subject—the kind of people or the world of sound or light portrayed. It involves a flexibility of association often appearing bizarre or far-fetched to the more conventional mind. The normal and frequently recurring ideas and patterns of association are, of course, not new, not creative in any real sense.

But more than technique or knowledge, or association, creation

involves imagination. People differ widely in the vividness of their mental images. Some can see persons and objects and others patterns of form, color, and action "in the mind's eye" constantly changing, sometimes subject to control and direction, sometimes seeming to form and reform independently. Others can "hear" conversations, melodies, and harmonies almost as clearly as if the sound waves were stimulating the ear drum.

Sometimes these images are entirely reproductive, repeating sights seen or sounds heard. Sometimes, however, they take new shapes which the creative artist can record by one technique or another in such a way that they have meaning and emotional significance for those who experience them. It would be a mistake to say that the artist merely records his mental images. Rather, he is expressing himself, his ideas, feelings, and emotions. The form of expression must be symbolic, but the symbols have meaning for others..

QUESTIONS

1. What problems of major or minor importance confront you at the present time? What problems have you already successfully met in the past?
2. Relate some anecdote of animal or child behavior you may have read or heard. What doubts might there be of the accuracy of the report?
3. Distinguish armchair psychologizing, anecdote, observation, and experimentation.
4. Does a "chance" solution sometimes involve previous knowledge and thought? Illustrate.
5. What are the characteristics of detour experiments?
6. Give an original illustration of (a) the wrong response to the right stimulus; (b) the right response to the wrong stimulus. What conditions made the response or the stimulus "wrong"?
7. Give original illustrations of (a) the law of field properties; (b) the law of derived properties.
8. How can learning be influenced by the future?
9. In the fable of the fox who obtained the cheese from the crow by praising her voice, was the problem solved? On the basis of what standards might the solution be criticized? Cite other illustrations of solutions that do not conform to accepted standards.

10. Cite cases in which experience is (a) helpful, (b) harmful, in meeting problems.
11. How might a group, like a committee, be more successful in solving problems than an individual? What conditions are necessary to make group thinking effective?
12. How do consequences determine the effectiveness of a solution? What dangers must be avoided? Illustrate.
13. Cite illustrations of generalizing on the basis of inadequate data concerning Germans, Japanese, Americans, capitalists, labor leaders. Are these generalizations stereotypes? Explain.
14. List some common superstitions. Might the case for or against them be proved scientifically? Suggest a technique for doing this for one of them.
15. Give illustrations of the lack of a scientific attitude.
16. What evidence is there that children have creative ability? That you have?

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V. APPLICATIONS OF PSYCHOLOGY

CHAPTER XVIII

PSYCHOLOGY IN BUSINESS AND INDUSTRY

PSYCHOLOGY AS AN APPLIED SCIENCE

Psychology as an applied science is not unequivocally distinct from pure psychology or that which is not applied. Analysis of any interest in the activities and experiences of individuals reveals an implicit hope that an understanding of them will ultimately lead to a prediction or anticipation of human behavior, and possibly even a control or modification of it. The scientist may claim to be interested merely in the pure facts, but he can scarcely refrain from criticism of or pity for those who bungle their practical affairs because they are ignorant of the pure facts and basic principles. Moreover, the pure facts and basic principles are more clearly and effectively presented when they are illustrated by applications in everyday life. Perception and illusion are better understood when their principles are demonstrated by applications to art. Laws of learning are better understood after they are effectively applied by the student in habits of study.

Applied psychology has contributed to pure psychology. Very often, in scientific efforts to solve practical problems, new truths are revealed and theory is validated. Efforts to measure intelligence and other capacities for practical purposes have clarified our concepts of these traits. Practical as well as humane motives for gaining better insight into abnormal or insane human behavior have led to great enrichment of our fact and theory in pure psychology. Psychology becomes applied when it serves purposes other than the culture of its own body of knowledge, but such other utilitarian ends need not necessarily preclude its own development. In learning of the applications of psychology, the alert student will have many opportunities to clarify and add to his understanding of pure or general psychology.

There is another kind of discrimination to be made in applied psychology, or psychotechnology as it is sometimes called, especially in Europe. As an applied *science*, it is not merely a bag of clever tricks more or less useful in handling people, nor is it simply the art or skill of using some understanding of human nature. Artistry or skill in the use of facts and sound principles is very important in meeting effectively the practical problems in human relations, but if it is to remain efficient and valid, it must depend on scientific research for these facts and principles. Applied psychology in this more restricted sense, probably more accurately called psychotechnology, does not cast off common sense and experience, but it does organize and verify them.

VOCATIONAL PSYCHOLOGY

Work as an important part of life. Life is activity, and work is activity directed to some ulterior end, some end other than satisfaction in the work itself. A living organism is made to function in certain ways, and it is alive only in so far as it does carry on the activities of which it is capable. The muscles of our leg are designed to keep us erect and propel us through the act of walking or running. When these muscles are rested and well-nourished, such condition is conducive to their activity and there is satisfaction in the activity. The activity may serve other or useful purposes and may be termed work, but it also tends to add to the experience and satisfaction of being alive. The same is also true of the nervous system. Man enjoys not only many sensory experiences, but also the activity of manipulating recalled experiences, creating new organizations of these in imagination, solving puzzles and mastering the difficulties of practical problems.

In short, work is one of the chief forms of living. Most of us, by the time we have lived a normal life, will have spent about two thousand hours a year, which is over one-third of all our waking hours, actually at work in some vocation. This will extend over a period of thirty-five or forty years; thus we live several years literally at some work. Not only is this an important share of our life, but our adjustment to the job, the satisfyingness of the friend-

ship and the cheerfulness found there, and the feeling of being somebody of consequence because our service of brain or brawn is respected and paid for, all contribute to and influence our whole life off the job as well as on the job. In so far as psychology emphasizes these facts and furthers a more adequate work life, it may be called a proper application of vocational psychology.

Nature of vocational adjustment. A popular concept of vocational adjustment is that of putting the right man in the right place. It is stated figuratively as the problem of getting square pegs into square holes and round pegs into round holes. This is an effective statement in that it is simple, but it is an oversimplification. In the first place, neither men nor jobs are square or round, not even figuratively. Men are not predestined for specific jobs. Jobs are constantly changing, but much of human capacity has not changed from that laid down in heredity centuries ago when work activities were quite different. Moreover, we know that both jobs and men have almost infinite variations and cannot easily be classified; and we have no reason to believe that there are just as many square men as square jobs.

The most adequate insight into the nature of vocational adjustment is provided by keeping in mind that man is a biological organism, that he grows into a job. We may compare vocational adjustment to the planting of a shrub or tree. We know that some plants do better in shady places, others need plenty of sun. Some need dry soil, others moisture; some thrive in acid soil, while others must have an alkaline one. We do our best to select plants and conditions of growth that go together, but the adjustment is only partly complete. The plant sends out branches on the sunny side and may even lean in that direction, or it may be burned on that side. It may send many more roots in the direction of greater moisture, and in attempting to do so a root may have to go around a stone. The plant is modified by the conditions, and in turn it modifies its surroundings. It may cause a sidewalk to bulge or raise up as its roots seek room to grow. In similar manner a worker modifies his working environment and is modified by it. He must adjust himself, but he also tends to make his job what it is. If he

is a man of small capacity he tends to settle into a restricted routine. If he is capable of vigorous growth, he not only does well the tasks originally given to him but, this being noticed, he is assigned new tasks and given help to do them, until he is the head of a big job or department.

When a man leaves an occupation it is like pulling a shrub or tree out by its roots; it mangles the roots and mars the landscape. Being a vocational misfit defeats much of the satisfaction on the part of the worker, and labor turnover is expensive for the employer. Therefore, vocational adjustment, aided by vocational guidance for the worker in selecting and preparing for the future, and vocational selection of workers by the employer should be given the benefit of scientific applied psychology, even though men cannot be classified and put into perfectly fitted pigeonholes. Finally, vocational choice on the part of the individual, which was discussed in Chapter XI, and the selection and placement of personnel by the employer, are not unrelated problems, but should be rather closely articulated functions.

PSYCHOLOGY IN INDUSTRY

The problems of modern industry resulting from its growth and increasing complexity have been largely those of dealing with human nature and organizing human relations. As problems of human behavior, these are problems of industrial psychology. It is common in many business or industrial organizations to have these problems handled in a Personnel Department or a Department of Industrial Relations. These personnel problems of a psychological nature will be discussed here in the order in which they appear in the various functions or subdepartments of a personnel department as these deal with an employee entering the organization.

The first contact is with the employment department. Here are encountered the problems of selection and placement growing out of the fact that individuals differ greatly in their fitness for any particular job. Many of the psychological studies in industry have been directed to tests, rating scales, interviews, and similar techniques and devices for use in vocational selection.

Selection and placement of employees. Applicants for employment in the early factories and shops sought the foreman or even the owner under whom they hoped to work. By the beginning of the twentieth century, however, many industrial and commercial organizations had grown so large that it became impracticable to have applicants seeking jobs from the many foremen scattered throughout large plants; so centralized employment offices were established. It was necessary that the person doing the employing should know the nature of each job and make an attempt to discover the qualifications of applicants for those jobs. This led, on the one hand, to job analyses and personnel specifications of the qualifications needed, and on the other hand to various devices or schemes for discovering whether these qualifications were possessed by the applicant. Some employers turned to unscientific methods. A few accepted the coöperation of psychologists who recognized the problem of employment selection as one of measuring individual differences in relation to specific job performance. A few psychologists, notably Hugo Münsterberg and Walter Dill Scott, experimented with tests before the World War, but it was not until after the experience with tests and personnel techniques in the American Army that psychologists began to contribute much to personnel work in industry.

Before an employment office should bother with tests, at least four questions should be answered: (1) Is there actually a problem in the selection of employees? That is, are many of those selected proving to be unfit for their job as shown in low production and the large percentage leaving or being discharged? (2) Are there more applicants than jobs, so that selection is possible? (3) Are there enough employees doing the same kind of work to make possible a reliable study? Conclusions should not be formed on the basis of a few cases or trials of the tests. (4) Is there a valid and reliable criterion of success at the work? Without some dependable indication of an employee's success, it is impossible to know whether the proposed measures of fitness distinguish between the desirable and undesirable applicants.

In the application of psychology to employment procedures,

usually the most difficult step in the problem is that of obtaining an adequate criterion of success. Some of the more common ones used are (1) quantity and quality of output—that is, production records; (2) time required to train the employee; (3) ratings by foremen; (4) length of service or stability on the job. The difficulty of obtaining a reliable criterion of success is illustrated by an experience of the writer. He was attempting to validate tests to measure capacity for success as a sales engineer. He asked a sales manager in charge of a group of sales engineers for ratings or a ranking on their success. The manager replied, “I don’t know how to rank them. On what basis should I rate them? For instance, one of the salesmen has made only one sale this past year, but it amounted to over a million dollars, for it was the equipment for a subway transit system. Another good sales engineer has sold to the largest number of customers, and thus has had to meet and convince the largest number of individuals, but his volume of sales in terms of dollars is not nearly equal to the volume sold by the other sales engineer. What should be the criterion of success, volume or number of sales?” Such problems make the validation or evaluation of tests for employment very difficult, and doubtless when test results fail to agree with later vocational success, it is often as much due to the inaccuracy of the criterion of success as it is the failure of the tests themselves.

Psychological aids in measuring individual traits. The surest way to determine whether an individual can do certain work successfully is to try him out in that work. There are, however, several serious objections to this procedure. It requires considerable time and is expensive, especially if the employee, after several weeks or months of training, leaves because he is discouraged or must be discharged because of ineptitude. Moreover, several days if not weeks or months may pass in the routine of many jobs before all phases of the work are sampled by the prospect being tried out. If all the essential elements of the work could be sampled and condensed into a short time for a tryout by the prospective employee, we should have a practical measure of probable success. That is just what a test is, a series of tasks or problems to be completed

by the individual taking it in a limited time. No test measures completely all and exactly the characteristics necessary for success in any type of work, but in so far as the psychologist is able to make the test approach that goal it is valid as a test to select employees for that occupation; that is, it measures what it is supposed to measure.

A test may measure very well a trait needed for success in a given job, and yet the test results may not correlate with performance on the job, for the simple reason that a job or vocation usually requires many more traits and broader capacities than those usually measured by a single test. In fact, most occupations require some qualifications for which there are no tests available. The important traits or qualifications for a particular vocation may be analogous to the three legs of a stool. All are necessary if the stool is to stand up and serve its purpose successfully. Two might be present, and measurements of them show that they are adequate, but if a third is lacking the stool falls. Measurement of any one leg will not reveal the possible height at which the stool can function if another leg is shorter, so that the longer must be cut off and part of it discarded. Although a person can compensate for some of his weaknesses by his strong desirable traits, he is eventually restricted in his success by any limitation of his ability to function in an aspect of behavior essential to a particular occupation.

The so-called general intelligence or mental alertness tests, which measure ability to deal with words, symbols, and abstract ideas, have often been tried for the selection of employees. Many investigators have found them worthless in the employment of manual workers. On the other hand, such tests have proven helpful in the selection of apprentices or workers to be promoted to positions of supervisory or executive responsibility, and in the selection of stenographers who would develop into good secretaries. One large steel company wanted to put into training or apprenticeship a score or more of young men. In the first place, only the applications of high school graduates were accepted. Over a hundred of these applicants then were given a common (abstract) intelligence test. Those ranking in the upper half were given a me-

chanical aptitude test. Those ranking highest in this test were given a personality inventory to discover whether any of them were emotionally maladjusted or unstable. The young men were then given individual physical examinations and personal interviews, and the final selection was made. Those who were selected have shown unusual progress in their apprentice training courses and give promise of becoming good machinists, mechanics, and other steel workers in less than the usual four years of apprenticeship.

For many types of work some specific capacity or function is the prerequisite determining success, and for this a special aptitude test is more valid. For instance, the tweezer dexterity test has proven of definite value in selecting workers in a watch factory

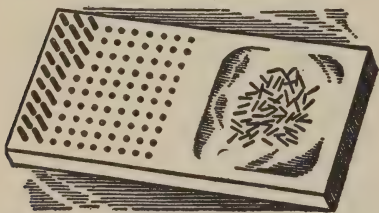


FIG. 35. THE O'CONNOR TWEEZER DEXTERITY TEST

Courtesy of C. H. Stoelting Company

who often use tweezers. The tweezer dexterity test consists of a board covered by a metal plate in which a hundred small holes have been drilled, ten rows with ten holes in a row. A shallow bowl of metal pins which fit loosely into the holes is placed next to the board, and the person being tested must pick up one pin at a time with tweezers and put it in a hole until all hundred holes are filled. The score on the test is in terms of the time required to fill the holes with pins. (See Fig. 35.)

In the use of tests for selection and placement in employment, we must emphasize that the value of each test must be checked against a reliable criterion of the success of the applicants. If the test measures accurately the trait of function it is supposed to measure, it is *valid*. If it invariably measures with the same accuracy—that is, if it is consistent with itself—it is *reliable*. It must be *reliable* in order to be *valid*, but it might measure something accurately and yet not be valid for the purpose intended. Finally, the value of a test or any device or method for selecting and placing

individuals in employment is always relative to other methods that might be used. The question is not whether the method proposed is perfect, but whether it is any better than the method which it displaces.

Rating scales. Interest and personality questionnaires and inventories as means of securing relatively objective data concerning the characteristics of individuals were discussed in Chapter XI. Another frequently used device for securing estimates of personal characteristics is the rating scale. Rating scales are not tests or questions answered by the subject. In fact they are not used or even seen by the person rated. They are merely a form or plan to aid in formulating and recording a person's judgment of the traits or qualifications of another person. They can give no better results than the personal judgments on which they are based, but they may help to make that judgment more consistent and more inclusive of the important traits to be considered. The nature of a rating scale can be understood by examining one of the better ones, such as that reproduced on pages 410-411.

Interviews. When an individual and a vocation are to be brought together, either in guiding one into a life work, or in selecting an employee, it is important that all factors of the total situation be considered. The objective tests and other measures are of basic importance in the final judgment, but many characteristics of the individual which help to complete the picture of him are to be obtained only in the face-to-face personal interview. The interview is not reliable for determining a man's intelligence or knowledge, but fortunately we have objective measures for those facts, for which the interview is the poorest source. On the other hand, the interview is most dependable for determining those traits for which we have the poorest or no objective measures. It provides a method for knowing the appearance, manner, and voice of the individual, and the emotional tone in which his reactions are set. Impressions gained in an interview alone may be very misleading, but when they are fitted on the skeletal structure of basic objective data from tests and other psychological aids, the whole picture of the individual is more realistic.

PERSONALITY REPORT—REVISION B, May 9, 1929 ¹

Name of student.....		
A—How are you and others affected by his appearance and manner?	<input type="checkbox"/> Sought by others <input type="checkbox"/> Well liked by others <input type="checkbox"/> Liked by others <input type="checkbox"/> Tolerated by others <input type="checkbox"/> Avoided by others <input type="checkbox"/> No opportunity to observe	Please record here instances that support your judgment.
B—Does he need constant prodding or does he go ahead without being told?	<input type="checkbox"/> Seeks and sets for himself additional tasks <input type="checkbox"/> Completes suggested supplementary work <input type="checkbox"/> Does ordinary assignments of his own accord <input type="checkbox"/> Needs occasional prodding <input type="checkbox"/> Needs much prodding in doing ordinary assignments <input type="checkbox"/> No opportunity to observe	Please record here instances that support your judgment.
C—Does he get others to do what he wishes?	<input type="checkbox"/> Displays marked ability to lead his fellows; makes things go <input type="checkbox"/> Sometimes leads in important affairs	Please record here instances that support your judgment.

¹ Reproduced by courtesy of the American Council on Education.

	<input type="checkbox"/> Sometimes leads in minor affairs <input type="checkbox"/> Lets others take lead <input type="checkbox"/> Probably unable to lead his fellows <input type="checkbox"/> No opportunity to observe	
D—How does he control his emotions?	<input type="checkbox"/> Unusual balance of responsiveness and control <input type="checkbox"/> Well balanced <input type="checkbox"/> Usually well balanced <input type="checkbox"/> Tends to be unresponsive <input type="checkbox"/> Tends to be overemotional <input type="checkbox"/> Unresponsive, apathetic <input type="checkbox"/> Too easily moved to fits of depression <input type="checkbox"/> No opportunity to observe	Please record here instances that support your judgment.
E—Has he a program with definite purposes in terms of which he distributes his time and energy?	<input type="checkbox"/> Engrossed in realizing well-formulated objectives <input type="checkbox"/> Directs energies effectively with fairly definite program <input type="checkbox"/> Has vaguely formed objectives <input type="checkbox"/> Aims just to "get by" <input type="checkbox"/> Aimless trifler <input type="checkbox"/> No opportunity to observe	Please record here instances that support your judgment.

Training for the job. The psychological principles of acquiring a skill or of training workers for a job are fundamentally the same as those for any learning. They may be summarized in the form of instructions or steps to be followed.

1. *Provide a desire or several motives for learning.* In so far as possible these should be intrinsic, a natural interest in the learning itself. They may consist of satisfaction in achievement, pride in the tangible results, desire to excel one's own record, rivalry with others, and the hope of promotion.

2. *Make as clear as possible to the learner precisely what he is to do.* The goal to be attained should be definite. Written and oral instruction, diagrams, and actual demonstrations all should be used.

3. *Set up the learning situation so that the learner will practice the performance or think through the ideas to be learned in the way that they are to function or be used.*

4. *Provide for the learner to know promptly and specifically wherein he made any mistake, unless it is quite evident to him, and wherein he was successful.*

5. *Work for accuracy before speed.* This rule seems at first to contradict the dictum of scientific management or efficiency engineers, notably Gilbreth, who stated that speed should be sought before accuracy. What Gilbreth was really concerned about, however, was that the learner use from the beginning the methods and exact movements which would be used in skilled and rapid work, regardless of whether it gave at first the more nearly perfect finished product. With this the psychologist would agree, for he also insists that the practice should, from the first, be in the manner in which the work is to be carried on later. Careful experiments show, however, that in using the speedy method—that is, the right one for greatest ultimate speed—accuracy should be the immediate objective rather than speed. In learning typewriting, for example, the correct touch method, using all fingers, should be followed from the beginning, even though typing is slower at first than looking at the keyboard and striking all letters with one of the first fingers. The touch method is the speedier method eventually, but careful investigations have shown that, in acquiring it, those

learners are ultimately faster who work for accuracy rather than immediately striving for speed in its use.

Methods of work. Gilbreth also insisted that there was a "one best way" for all workers on any particular job. Not only would he look for the best worker to find this best way, but he might combine units or parts of performance from various good workers because he believed in many cases no one worker used altogether the "one best way." This belief is not consistent with two psychological facts. First, it fails to recognize individual differences. Second, a worker's skill consists of more than the sum of movements or units which may be more or less arbitrarily separated for study. The integration of these separate movements is very important in the skilled act.

A study of methods of packing made by an English psychologist illustrates these points. The work studied was that of girls putting small articles (presumably candy) into small cups and then arranging them in a box. The girls differed considerably in their efficiency, and among both the slow and the fast workers there were two distinct methods of packing used. Some girls picked up each piece, one at a time, making a rather long reach to a large tray for each piece, cupping it, and placing it in the box. Others picked up several pieces at a time, put them down beside the box, and then cupped them rapidly into it. The first method saved time and effort in that the pieces were handled only once, but it lost time and energy in requiring an extended movement, even some stretching, to take each article off the large tray. The second method avoided so many long reaches, but had the disadvantage of picking up the pieces twice. Which was the better method? It depended on the physiological and psychological nature of the girls. The girls with long arms and quick extended movements were speedier in using the first method. The girls whose physiological nature enabled them to obtain speed in short accurate movements, such as the cupping, worked faster with the second method. There was a truth in the Gilbreth statement, however, in that there was a best way for each girl, and it was noteworthy that the best method had often not been spontaneously adopted by her. In learning the

work, each girl probably had followed the method shown her, or she copied that of her neighbor. It was necessary to study each girl's movements and then insist on the method best suited to her.

Men trained as engineers were the pioneers in scientific management, involving study of methods of work. Frederick W. Taylor was interested in studies of the time required for units of work, and Gilbreth, who followed, insisted that studies should first be made of the motions to see whether they were the minimum and the best ones before the time was determined for a particular job. The applied psychologists have more recently analyzed and added new insights to these earlier findings. Some of the principles which are psychologically sound and help to prevent waste of time, energy, and thought in work are stated briefly here. The student should find interest in verifying these principles on the basis of his knowledge of psychology.

1. *Eliminate unnecessary movements.* Often useless extra movements have been retained which were acquired during a trial-and-error learning process.

2. *Provide support for the body wherever it does not interfere with action.* This includes not only seats but also benches on which the arms may be rested.

3. *Arrange materials and tools in the order in which they are to be used and within easy reach.*

4. *Minimize the necessity for discrimination, decision, and hesitation.* This is largely provided for by standardized materials, tools, and processes. Deciding how to perform an act, or selecting tools and materials, requires time and nerve energy, and thus should be avoided.

5. *Set up the work processes so that habitual and rhythmic movements will be established.*

6. *Arrange for longer continuous sweeping movements, which are easier than short jerky ones.* Starting and stopping the movement of any part of the body requires energy.

7. *Successive movements should be so related that one movement passes easily into the next.*

8. *Have both arms used simultaneously and so as to balance each other.* That is, they should move symmetrically and in opposite directions.

9. *Adjust the methods of work to the individual workers.*

10. *Adjust machines and tools to the individual workers and to the particular work.*

Conditions of efficient work. Assuming that the worker has been well selected and trained for his task, there are other conditions affecting his efficiency which are to be controlled. In general, these conditions may be classified as (1) the psychological conditions of the worker, (2) the physiological conditions of the worker, and (3) the environmental conditions of work. Important in the first group are incentives, attitudes, and satisfaction in work. In the second group would be fatigue, loss of sleep, and the effect of drugs. In the third group are classified illumination, ventilation, noise, and other distractions. The classification into these groups is more or less arbitrary. No sharp distinctions can be made between psychological and physiological factors, and all interact on each other.

Attitude toward work or an employer is probably the most important condition of work. In one experiment a group of college freshmen were subjected to hazing and exhausting conditions such as long hikes and extreme loss of sleep for five days. At the end of this period they were told that their entrance to a fraternity depended on their scores made in an arithmetic test. This motivation seemed to prove much more effective than any conditions of fatigue, for these freshmen completed almost twice as many problems as were completed in the same time by a group of juniors who had not been subjected to the hazing and fatiguing period, but also were not motivated by competition for admission to a fraternity or by other motives than those found in ordinary class work.

In another investigation, in a factory, various work conditions such as improved illumination and rest periods were added, and the productivity of the workers increased. When some of these improvements were removed, however, the rate of production still held up, and further study revealed that the real cause of increased

production was the better attitude of the workers when they realized that the management was really concerned in their conditions of work and welfare and was experimenting to improve them.

Chief among the physiological conditions affecting efficiency is that of fatigue. By fatigue is meant lowered capacity for work as a result of conditions in the body produced by work. Some of the symptoms of fatigue are subjective sensations of lassitude and inhibitions commonly called "feelings of fatigue," production lowered in quantity and quality, loss of skill and rhythm in work, worry, irritability, and increased absence from work. There is no single reliable measure or criterion of fatigue, and various causes might be the basis for any of these symptoms, but where several of these have appeared among a group of workers, it has usually been found that rest pauses introduced into the work periods tended to eliminate such symptoms. In a state of fatigue, the worker begins to try to overcome the afferent inhibitory impulses and to drive motor impulses through the resistance met where the nerve fiber ends at the muscle fiber. The increase in the discharge of nerve energy or pressure to do this usually results in irradiation or spread of the motor impulses into muscles other than those necessary to do the work. This becomes apparent in the tight lips, frown, set teeth, grunts, and even clenched fists of the worker. None of these expenditures of energy actually furthers achievement; they are therefore waste due to fatigue. Often useless or wrong movements that were used during the stage of learning the work by trial-and-error will reappear, and if work is continued during fatigue bad habits may form. In short, skill is lost and more energy is expended to do the same work. If the increase in effort is sufficient, production may not fall, but it is maintained at a great sacrifice of efficiency. Rest pauses often dissipate many of these symptoms of fatigue. They should be introduced just before production begins to fall. Work periods should be long enough to get the advantage of warming up to the work, but short enough to avoid excessive fatigue.

Illumination engineers had at first the problem of providing sufficient artificial lighting, and as this was improved the work

output often increased. With the new highly incandescent lamps it is relatively easy to furnish enough light, but further study by psychologists, notably Feree and Rand, proves that other considerations are equally important. Chief among these is the requisite that the whole field of vision be as uniformly lighted as possible. This principle is based on at least four characteristics of the human visual equipment. (1) The eye tends reflexly to turn toward bright objects or spots. If the visual field is not uniformly lighted there will be conflicting tendencies of the eye muscles, especially if the work requires the eyes to move from the brightest spots. (2) The retina is not uniformly sensitive in all its parts, being more sensitive to light in its perimeter or outer part, which receives light coming to the eye at an angle to the direct line of vision. When the eye is looking at a part of the field less intensely lighted, the iris would tend to open and let in more light. Then, however, too much light would come in from any bright spot at an angle to direct vision, and the iris would close to keep it out. This would make it difficult to see the object in weaker light. Thus there would be another conflict of the reflex tendencies. (3) The eye tends to focus upon the object attended to, but if there is a brighter object than the one being given voluntary attention, there will be a tendency to focus on it, and thus again a conflict which is fatiguing. (4) Due to contrast, the bright parts of the field of vision seem brighter and the dark parts seem darker. Thus the uniformity of the lighting of the work environment is important. Indirect illumination in which the light is reflected from surfaces that diffuse it usually meets this condition best. This also means that brightly polished or shiny objects such as nickel plated handles or glass objects should not be in the field of vision.

Among the other conditions of the working environment is the surrounding air. The temperature of the air is the greatest factor in proper ventilation for efficiency. Although an extreme reduction of the oxygen content of the air to 14 per cent or an increase of the carbon dioxide to 2.4 per cent is physiologically harmful, these conditions are practically never reached, for in the most poorly ventilated schools and factories the oxygen is reduced to only

19 per cent and the carbon dioxide is increased to only 0.3 per cent. High and low temperatures of the air not only produce discomfort but also increase accidents. In one investigation the accidents were fewest in a munitions factory when the temperature was 67° F., and increased 35 per cent when the temperature fell to 52° F.

Noise and vibration also tend to reduce efficiency. They may be accompanied by equal or increased output, but it is at the expense of greater expenditure of energy to counteract the distracting stimuli. Vibration tends to cause reflex contraction of the muscles, which increases fatigue. There is always some adaptation to distracting or unfavorable environmental conditions, but it seldom is complete and is usually at the expense of human energy.

Monotony. No work is monotonous; that is, monotony is not a characteristic of a job. Monotony is a state of mind or rather a reaction of the worker to a task. Certain repetitive work processes may impress certain workers as monotonous. Monotony has been explained to be due to one or more of the following causes: (1) Persons suffer boredom who find it necessary to give some but not all of their attention to a task. Such work may be very simple routine tasks but require some attention to avoid error or danger. Repetitive work which permits all the attention to wander and the worker to daydream may not be disagreeable. (2) When the work does not appeal to the worker, he must exert effort not only to perform the necessary movements, but also to repress the intruding ideas and desires, and the fatigue in holding the attention is monotony or boredom. (3) Some persons find it difficult to receive uniformly repeated stimuli, and require effort to overcome inhibitions in reaction. In other words, repetitive sounds or movements of a machine "get on their nerves."

Vocational selection of persons with neither too much nor too little ability for the job is one remedy for monotony. Also, the work can be made more interesting by giving employees a broader insight into the whole production process in which he participates. An automobile factory worker sees more in his task if he understands just how the part he makes fits into and works in the completed machine. Variations in the nature of the work, either by

shifts in the method used or in the type of work done, likewise help to minimize monotony.

Morale and leadership. The topic of monotony has led us to a consideration of satisfaction in work. Previously we have seen that as a result of heredity and environment human nature has certain trends that give satisfyingness in physical and mental activity at which one can succeed, satisfyingness of mastery, of following a leader, of carrying on activity with and in the company of others, and of feeling that one is somebody of consequence. When these satisfactions are realized in work, the workers are motivated, coöperative, and happy, and are said to have morale. A strike is the opposite condition, or the collapse of all plant morale. One or more interests or urges have been blocked and repressed. Strikers' demands may not always reveal the real urge that is thwarted. In fact, the workers often do not know or understand the real cause of their unrest, and usually make traditional demands for more pay and fewer hours. Demand for union recognition often approaches more nearly the real want, a recognition of their importance in the world and in the general scheme of things. A new type of leadership is required to maintain high morale, and it is replacing the old in industry. The new leadership implies that good management, for the benefit of both the leader and the led, is the means to leadership and the justification for the privilege of leadership. Two of the industrial psychologists who have described this leadership may well be quoted here.

There is a growing "realization of the advantage of supervision that 'listens' rather than gives futile orders; that gains understanding of individual workers and thus is able to aid and guide them to develop self-control and personal efficiency. The passing of the yelling, order-giving supervisor is presaged."¹

Psychologically it is incontestable that the good leader is he who gets others to act because they come to want to act as he proposes. The emphasis shifts from his "will" to his grasp of their desires and purposes

¹ Elton Mayo, "Changing Methods in Industry," *Personnel Journal*, vol. 8 (1930), p. 326.

and his insight into how what he wants, or comes to want, can be fairly reconciled and integrated with what they want or come to want.¹

PSYCHOLOGY IN ADVERTISING AND SELLING

Motives of man as consumer. Applied psychology is interested in man as a consumer as well as a worker or producer. He is the same man with the same fundamental nature and interests, but his behavior is directed toward the selection and use of things and services for more or less direct satisfaction of his wants. The man who has these commodities and services to sell is concerned with influencing the consumer's choice, but the applied psychologist is a neutral party interested in understanding the principles and forces governing the behavior in such a customer-seller relationship.

The earlier psychology of selling gave us the steps or static cross-sections of the selling process such as attention, interest, desire, action, and satisfaction, but modern dynamic psychology has done much to explain the mental processes themselves and indicate the factors controlling them. Analysis shows that successful salesmanship starts with the wants or needs of the buyer and follows through his mental processes in arriving at a particular commodity to satisfy his wants. The salesman skilfully directs the thinking so that the buyer's need is associated with the seller's goods. Most sellers are interested not merely in the current sale, but in making a customer. This requires that the commodity sold meet a real need and give satisfaction.

The advertiser or salesman must first know what is on the buyer's mind in the way of wants and then show how his commodity will satisfy that want. This is going with the consumer's stream of thought. He is not primarily interested in things, and to begin talking about the merits of a product is starting at the wrong end and going against his interest. The true salesman seeks the problems of his prospective buyer and coöperates in solving them by informing the consumer of products and services prepared for that purpose. This educational service is the only real justification for

¹ Ordway Tead, "Trends in Industrial Psychology," *Annals of the American Academy of Political and Social Science*, vol. 149 (1930), p. 116.

advertising and selling. Any other type of influencing the buyer is exploitation. It is not easy to discover the consumer's wants, and often he does not know them himself. He may have needs but not realize it and, therefore, not have wants to meet these needs. Then the educational result of advertising and selling is toward raising the standard of living of the consumer. A parent may need insurance or antiseptics to protect his children, but not want them because he does not know their importance.

In order to know the wants and thus the mind of the buyer, the seller must have at least a practical knowledge of psychology. General information, however, is not enough. He must know the particular buyer or group of buyers and the specific trend of their wants. For this purpose market surveys are made, and psychologists have contributed to the development of techniques of interviewing and the statistical treatment of data in the measurement of public opinion and consumer reaction to advertising and buying trends. In this work the Psychological Corporation ¹ has been outstanding. It has developed Brand Barometers through the coöperation of about fifty psychologists under whose supervision periodic interviews are made in four thousand homes of consumers. These Brand Barometers measure the direction in which people are being influenced, and thus measure the effect of advertising as well as the trends of wants and buying habits. These studies attempt to answer such questions as: Are more or fewer people, among the customers available, being influenced to buy a certain brand or type of product—for example, tooth pastes versus tooth powders, or Campbell's tomato juice as compared with other brands?

These studies of buying trends reveal that the mechanical features of an advertisement are not the effective part so much as the cen-

¹ The Psychological Corporation is an organization of psychologists who wish to make the services of scientific psychologists and psychological techniques available to companies and individuals on a businesslike basis. It is non-profit-making in that surplus income is devoted to further psychological research. Its services include *personnel*, selection and training of employees for employing companies; *personal problems*, individual examinations and counsel on vocational, educational, and personality problems; *test service*, the sale of tests and advice on the use of tests; and *market and advertising* research.

tral idea, if any, given to the consumer. That is, the advertisement, to be effective, must present an idea that fits in with interests and thinking of the consumer and seems plausible to him. A quotation from Link, the psychologist in charge of these market surveys, illustrates this point.

The Psychological Brand Barometers have been measuring for two years the trend toward Dr. Lyon's tooth powder. Many people regard this trend as a result of a natural reaction against tooth pastes, and a desire for something new. However, these studies of causes and motives show nothing of the kind. They show, first of all, that the public had become highly confused by the conflicting advertising claims made for different tooth pastes. Such claims as—good for the gums, good for the acid mouth, whitens the teeth in three days, removes seven stains, sweetens the breath, helps get your man, in fact, almost everything but "cleans the teeth"—had not only confused people, but made them quite skeptical toward tooth paste advertising generally. Against this background, such a direct and apparently sincere claim as that of Dr. Lyon's "Do as your Dentist does," was bound to have a powerful effect, and did.¹

In order to get the attention at first and then make holding this attention easier, an advertisement must be pleasing to look at. In this respect, the most remarkable improvement is found in the advertising of today over that seen at the turn of the century. Psychology as well as art has helped in determining the appropriate size, shape, location, color, illustration, copy, and typography of advertisements. A mistake is made, however, when only attention is sought, for the advertisement may get the attention, but after the reader has passed on, he does not know what was advertised. The main purpose of advertising or selling is to develop in the mind of the consumer an idea of how he can solve a problem of satisfying one of his wants by the use of a specific commodity.

QUESTIONS

1. Explain how the solution of a practical problem of human behavior might make a contribution to "pure" psychology.

¹ H. C. Link, "Psychologizing the Future," *Advertising and Selling*, vol. 24 (February, 1935), pp. 27 and 46.

2. Criticize the "square peg in the square hole" concept of vocational guidance, and state a better concept.
3. Name some common evidences of traits of individuals.
4. Why may it be said that we have no such thing as a really general intelligence test?
5. What is the essential difference between a test and a rating scale?
6. What determines the value of a test and should decide the question of whether it is to be used in selecting employees?
7. Explain just how a good foreman should train new employees in some specific job.
8. What are some of the symptoms of fatigue other than lowered rate of production?
9. Outline the procedure or steps you would follow in selling a prospective customer some article which he needed but did not want.
10. Show how habits may increase or decrease mental efficiency.
11. Why are test scores or other objective data of performance not complete or valid measurements of the effects of various factors on efficiency?
12. What is meant by vocational adjustment? What is adaptability in terms of an occupation?
13. Make a list of psychological problems in the field of business and industry. Compare your list with other lists made by members of your class.
14. Suggest several ways in which one might become interested in a vocation or profession.
15. Secure from your library a copy of a history of psychology and answer the following question: What contribution to business and industrial psychology was made by Hugo Münsterberg? Secure from your library some books that he wrote as a pioneer in this field.
16. What principles of psychology would you use in making application for a position?
17. What is the present status of business and industrial psychology?

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CHAPTER XIX

PSYCHOLOGY IN LAW, POLITICS, AND RELIGION

PSYCHOLOGY IN LAW AND CRIMINOLOGY

The detective as a psychologist. Those who are familiar with detective or mystery stories know that in searching for the criminal the first step is to seek a motive or motives for the crime. Whether one is a detective or not, his efforts to discover the guilty person would probably lead through an attempt to understand why anyone would want to commit a particular crime, and then to the person who might be thus motivated. This means going into a study of human motives and the factors which affect human behavior. It also is an attempt to understand why the guilty person would commit an act in spite of all the pressure of public opinion, law, and other means of social control. When such acts are committed, it is because of an overwhelming urge which breaks down all barriers of restraint, or because the inhibitions and other restraining forces have become weakened. This is a simple statement of the cause of crime, but an understanding of all the conflicting forces from heredity, training, habit, public opinion, and fear of punishment is not easy to obtain for any particular individual.

Anyone functioning as a detective, or attempting to get a clue as to the cause of a crime and the type of person who would commit it, should consider whether there was any pecuniary or far-reaching material advantage to the perpetrator. This would tend to indicate that the person was intelligent, shrewd, and at least normal in some of his intellectual functions. On the other hand, if there seemed to be no advantage to the criminal, this would tend to indicate that his act was a result of uncontrollable impulses or some mental disorder. The detective's practical knowledge of psy-

chology aids him in making a keen interpretation of clues. For instance, a double murder may have been committed, of a man and a woman. If the man's body showed mutilation, but that of the woman revealed it had been tenderly laid on a bed or at least the head on a pillow, there would be some indication that the act was committed by a rival of the dead man in a triangular love affair. Petty thievery of articles which satisfy simple organic needs, such as food, or satisfy simple interests, such as toys or novelties, would be committed by children or the mentally subnormal. Stolen articles which have little use as sources of personal satisfaction, and have no resale value, would indicate they might have been taken by a kleptomaniac with irresistible impulse to collect.

Causes of crime. No one is "a born criminal," but there are many tendencies with which a person may be born that predispose him or make him more susceptible to other causes of criminality. A feeble-minded person is not any more criminal than others, but because of his inability to foresee the consequences of his act, and his inability to appreciate the finer and higher motives in life, he is more susceptible to criminality. The crimes which the mentally subnormal commit, however, would not be those of embezzlement, fraud, or such shrewd practices, but rather those which are the satisfaction of simple physical urges. For instance, not all feeble-minded women are prostitutes, nor are all prostitutes feeble-minded, but a feeble-minded girl is much more susceptible to the tendencies which would lead her into such illegitimate profession. The feeble-minded usually find it difficult to keep a job, and as a result they are subject to unusual temptation to eke out a livelihood by petty thievery.

Various forms of insanity destroy either the ability to appreciate the consequences of an act, or the insight which provides inhibitions to impulsive acts. Some persons who have epilepsy go into a state of excitement or epileptic furor which makes them excessively impulsive and under tension to act which may lead to violence upon another person. Any person whose mentality begins to deteriorate tends to rationalize or explain his failures in terms of causes outside himself which often include other persons. If he thus develops

illusions of persecution, it only seems reasonable for him to protect himself against the persecutor, and if no other solution seems possible, he will destroy the persecutor. Paresis is a type of insanity caused by syphilitic infection of the brain, and this often results in a general loss of finer sensibilities and inhibitions which differentiate a cultured and even civilized person from primitive nature. As this disease makes its insidious progress, the person who was formerly a model citizen will begin to give way to debased impulses leading into drunkenness, adultery, and general debauchery. Many drugs have much the same effect as the deterioration of the higher brain centers, for their effect is to destroy temporarily the ability of these to function.

There is no doubt that the social background and other environmental factors play a large part in the development of the criminal. Standards of what is considered right and wrong, or fair and just, are developed very early in the mind of the child. It is not difficult to understand why children have no high regard for law when they have seen from an early age how poverty is fought only by stealing, and punishment avoided by collusion with the local police through sharing ill-gotten gains from gambling, bootlegging, and various forms of vice.

Analysis of the causes of crime or delinquency reveals that such acts are like other forms of human behavior in that they result from the interaction of human tendencies or organic tensions and the conditions or forces of the environment. They are considered anti-social or delinquent when they do not conform with public opinion or the mores which have been crystallized in the form of law.

Determination of guilt. After the suspected person or persons are found, there is the problem of determination of guilt. Efforts to obtain proof of guilt are centered on facts of the crime and the statements and behavior of the suspected person. Several methods based on scientifically established facts of human behavior have been proposed to indicate objectively the guilt or innocence of an individual. One procedure is the association method. The subject is asked to listen to a series of words pronounced to him and to respond with the first word that comes to his mind. The series of

words is made up of some not related to any fact of the crime and some "critical" words that are related to some aspect of the crime or experience of the criminal while committing the crime. Let us assume that a burglar was robbing a home of silverware when he was surprised by the owner, whom he killed by a blow on the head with a heavy vase. Some of the stimulus words, with the critical ones italicized, might be as follows: house, wagon, *silver*, city, table, *vase*, boy. Guilt might be indicated by the nature of the response, one that would scarcely be given from mere chance by an innocent person, such as *vase—head*. Unusual delay in responding to the critical stimulus words, or innocent words immediately following, would be symptomatic of guilt. The principle on which this method is based is the fact that the association of ideas or rather the implicit verbal response cannot be controlled when the stimulus word is given. The suspect may control his overt or spoken response, but if he tries to avoid saying the first word that comes to his mind because it indicates undue familiarity with the crime, he spends more time in making a response than he required in making responses to other words.

Other methods of obtaining indicators of guilt also make use of responses that ordinarily are not under voluntary control of the person being questioned. These are physiological activities that occur when the person is emotionally disturbed, as he might be when a critical word associated with his criminal activity is presented as a stimulus. These methods and the equipment necessary for applying them are sometimes called "lie detectors," for they are sensitive to the inner emotional disturbances usually present when a guilty person is lying to conceal his guilt. Systolic blood pressure—that is, the pressure produced at each beat of the heart—is usually increased when the suspect is lying, and this increase is shown by a sphygmomanometer which measures the blood pressure. The rate of heartbeat is also changed as shown by a sphygmograph. The rate of breathing is usually changed and this is indicated by a pneumograph. The particular change is in the length of time for inspiration compared to the length of time for expiration. When giving a false answer to a question, the suspect tends to make

shorter inspirations compared to his expirations before answering, and to make the inspiration longer compared to the expiration after he has answered. This change in ratio is reversed—that is, decreased—after answering a question truthfully. This is shown in the following formulas.

$$\begin{array}{lcl} \text{Truthful answer} & \frac{I}{E} \text{ before} & > \frac{I}{E} \text{ after} \\ \text{False answer} & \frac{I}{E} \text{ before} & < \frac{I}{E} \text{ after} \end{array}$$

One other method of measuring physiological change in the person conscious of guilt is to measure changes in the electrical conductivity of his body. The body always offers some resistance to the passage of electric current between two electrodes placed on different points of the skin. When, however, any stimulus excites the subject emotionally, this resistance is decreased and the increase in the electric current can be measured by a sensitive galvanometer. This change in the resistance of the body during emotional excitement is known as the psychogalvanic reflex, and its presence when critical questions or stimulus words are presented to the suspect indicates conscious associations which probably would be present only if the person is guilty.

Validity of testimony. The direct questioning of the suspected person by policemen before any trial or hearing is an attempt to determine degree of guilt. The police examination may vary from perfunctory or routine questions to third degree methods. The susceptibility of the individual under emotional pressure to suggestion has led to various limitations on the questioning of the suspect and of witnesses in court. Incriminating questions and questions that suggest a particular answer are forbidden except to a certain extent in the cross-examination. For example, the question "Didn't you see a gun?" is more suggestive than "Was there a gun?" and both are more suggestive than "What did you see?" If the questioning is prolonged when the subject is extremely fatigued, his inhibitions break down, suggestiveness increases, reliability decreases, and the attempts to determine degree of guilt are often perverted.

Other factors which affect the validity of testimony are those which affect the accuracy of all memory. In the first place, witnesses do not observe accurately or thoroughly. Secondly, the rate of forgetting is very rapid at first. Finally, in recall, we not only omit many facts but we tend to tell a complete and plausible story, even though it may involve the introduction of new or assumed elements and frequent exchange in position of other parts of the story. We need only to consider how gossip grows to realize the possible error in testimony.

Interpretation of evidence. Evidence must be interpreted and judgments arrived at in the court room. A psychological understanding of the processes of perceiving and reasoning helps us realize that many subtle factors play a part in giving us our conclusions, beliefs, and attitudes. We tend to believe what we want to believe in response to our emotional attitudes. In the first place, the criminal rationalizes to justify his infringement on the law or even to prove that he has not even broken the law. The members of the jury tend to arrive at a verdict consistent with their preconceptions, prejudices, and emotional attitudes. The lawyers realize this and tend to arouse emotional attitudes favorable to their case, knowing full well that if the very human members of the jury feel strongly a certain way, the reasoning toward a favorable verdict will be largely taken care of. To facilitate this, the lawyer often provides subtle suggestions and rationalizations. The judge is primarily responsible for keeping the court procedures so regulated, and the evidence and argument presented so censored, that all are conducive to valid conclusions in regard to the truth, but even the judge is not immune to emotional attitudes and rationalization.

Psychological treatment of the criminal. Punishment is effective just in so far as it is adjusted to fit the criminal rather than the crime. In order to prevent crime, we must understand the criminal. To explain why a criminal committed an act is not to excuse it. To understand the factors that developed his attitudes and his anti-social behavior is the first step in controlling them and his behavior.

At least four motives may give rise to punishment of the criminal or delinquent. The first and oldest motive is retribution, the in-

instinctive tendency to fight back, taking an eye for an eye and a tooth for a tooth. That is, of course, mere savage vengeance and does no one any good. It is far from being discarded, as is evidenced by lynchings, and it lives in our law in that the punishment is according to the crime rather than directed to benefit society or the criminal.

A second purpose of punishment is its deterrent effect on the criminal and others who might be tempted to commit crime in the future. There is no doubt that punishment or the fear of punishment keeps many persons from taking advantage of others or committing acts deleterious to society in general. This method of preventing crime, however, is not so simple or so effective as is popularly believed. In the first place, punishment is not at all sure, for many delinquents are never caught; and of those who are, many are not convicted and sentenced. Since the real criminal is essentially a gambler by nature, he is willing to risk the relatively small chance of being punished. If the law makes severe punishment mandatory, the jury hesitates to return a verdict of guilty. When there is much cruelty to prisoners or many cases of capital punishment, the people tend to become brutalized and fatalistic so that the prospect of death loses its deterrent effect. Crime was at its highest in England when the number of crimes punishable by death was largest.

A third objective in punishment makes it primarily not punishment. It is for the purpose of protecting society and the members of society. The antisocial or predatory person is forcibly put under control so that he can do no further harm. This is doubtless necessary for the genuinely incorrigible; but the ease of dealing with the delinquent in that manner should not be permitted to weaken efforts at prevention and reform of the criminal.

Reform or reëducation of the delinquent, the fourth objective of punishment, is the most intelligent as well as justifiable treatment of him. If it is to be successful it must be based on the psychological laws involved in any learning. He must have some insight, even though very simple, into what should be done; conditions must be conducive to the desired behavior; wrong behavior should be ac-

accompanied or immediately followed by stimuli that provoke some other behavior; and right behavior should bring its natural rewards and stimuli to continue it.

Psychological treatment of the criminal, then, must begin with a study of him rather than of the law or of the crime. First his mental capacity to realize the significance of his acts and to make moral judgments must be determined. This will give an indication of the level and type of motivation that will affect him. If he has become a repeater and cannot be reëducated he should not be permitted to run free in society regardless of the nature of his latest crime. On the other hand, there are persons who have had no real opportunity to learn, and need to be shown how to satisfy their fundamental urges in avenues acceptable to society. Finally, some of the worst enemies of society, by mental endowments or by economic and social position, are able to prey on their fellow men and at the same time employ legal aid both before and after their acts so that they are never dealt with by the law. For these offenders and for prevention of crime in general, education that develops a sense of responsible membership in a democracy is necessary.

PSYCHOLOGY IN POLITICS

Psychology of political issues. The true political leader or statesman must face real problems and issues. These are dilemmas or choices to be made that arise from conflicts of fundamental human interests. Old established interests and methods of doing things conflict with the new. The old is maintained by the crystallized habits and institutions of the outgoing generation which resists experimentation by the generation coming into power. Thus, we have Liberals versus Conservatives, or New Dealers versus Old Guard. Moreover, the *status quo* is usually adjusted to and supported by vested interests which are in control. This leads to class conflict between the ruling group, which may or often may not be a majority, and the group not in power. Another conflict is between immediate results or values and ultimate results with usually greater values. The opportunist or practical man is thus often urged against the theorist or idealist. A third conflict is that of small

local interest versus the larger centralized unit. Thus we have States' rights versus the Federal Government, or home rule in the local school district versus the county or larger unit of administration. A fourth conflict is that of evil means versus good ends. Thus we may have the sales tax, which bears most heavily on the poor, proposed as a means to give relief to the poor. A lottery may be proposed to obtain funds for public education. These are some of



Fig. 36. THE ART OF POLITICAL PERSUASION

Courtesy of Mr. Joseph Di Gemma

the conflicts at the basis of real political issues. These stresses are possible because individuals differ greatly in their intelligence, foresight, socialization, and attitudes, and they change very slowly. Mass opinion of the majority, particularly of the unenlightened, is not always the best judgment, and the politician often prefers the easiest way to get the majority rather than educate it to the best idea.

The demagogue. The demagogue takes the side of an issue that makes it possible for him to appeal to the prejudices and popular

THE BRYAN-WILKE SCALE FOR RATING PUBLIC SPEAKERS ¹
(Copyright, 1935)

Directions:

This Scale provides a basis for improving the quality of speeches. In rating a public speaker check whichever one of the words in the five boxes at the right seems in your judgment to describe that part of the speech most accurately.

THE SPEAKER:

First impression	Striking	Impressive	Pleasing	Commonplace	Unpleasant
Personal appearance	Distinguished	Real asset	Acceptable	Nondescript	Unattractive
Manner (poise, bearing)	Complete assurance	Well-poised	Self-possessed	Over-aggressive; Timid	Pompous; Ill-at-ease
Voice	Impressive; Arresting	Pleasing	Adequate	Unpleasant	Irritating

¹ Reprinted by courtesy of the authors.

Diction (distinctness, accent, pron.)	Cultured	Good usage	Acceptable	Careless; Affected	Offensive
Activity (movement, gestures)	Dynamic	Animated	Appropriate	Distracting; Stiff	Annoying; Immobile
Interestingness (originality, emotional appeal)	Fascinating	Absorbing	Interesting	Dull; Over-done	Boring; Stupid
Flow of language	Eloquent	Fluent	Unimpeded	Hesitant	Labored
Interest in job	Impassioned	Whole-hearted; Sincere	Business-like	Indifferent; Mechanical	Apathetic; Insincere
Clarity (getting across)	Exceptionally clear	Easy to understand	Fairly clear	Vague; Confusing	Unintelligible

THE BRYAN-WILKE SCALE FOR RATING PUBLIC SPEAKERS—*Continued*

THE SPEECH:

Opening remarks	Arresting	Promising	Interesting	Uninspired; Commonplace	Disappointing
Use of language (vocabulary, sen- tence structure, style)	Vivid; Polished	Very well chosen	Appropriate	Colorless; Stilted	Crude; Uncultured
Knowledge of subject-matter	Masterful	Thorough	Adequate	Sketchy; Inaccurate	Unprepared; Misleading
Organization	Excellent structure	Unified	Reasonably coherent	Loose; Rambling	Incoherent; Disorganized
Flow of thought	Remarkable spontaneity	Lively	Steady; Easy	Involved; Slow	Gets nowhere

Reasoning	Unassailable; Flawless	Convincing; Sound	No obvious weakness	Dubious	Fallacious
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Concluding remarks	Unforgettable	Impressive	Revelant	Abrupt; Weak	Antagonizing; Confusing
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Handling of ques- tions	Brilliant	Stimulating	Competent	Elusive; Inconclusive	Inconsistent; Rattled
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GENERAL OPINION:

Value of speech	Invaluable	Important experience	Worth hearing	Somewhat boring	Time wasted
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To be heard again?	Decidedly yes!	With pleasure	Wouldn't mind	If necessary	Never!
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beliefs of the electorate. If necessary he will raise a false issue, arouse class conflict, or build up a straw man whom he can oppose. Often this is done not only to arouse the people but at the same time to draw their attention from real issues or serious abuses in government. Thus a candidate for the mayoralty of a large city may appeal to the masses by loudly proclaiming that he will eliminate all pro-British teaching from the schools, and "punch King George on the nose" if he meddles in the city's affairs. At the same time that he seeks a popular following in this way, he also hopes to direct attention from the fact that graft has so depleted the funds of the city that the school teachers have not been paid for months. Another candidate may obtain a popular following by being a wise-cracking dandy, anything but a real leader helping the people face real issues and getting at the basic facts necessary to solve public problems. The effect of such methods on the masses is intensified, in the few weeks previous to an election, by campaign rallies, repetition of slogans, and even the spread of false rumors that cannot be proved false before it is too late. By such means the demagogue may become a dictator, but always disguised as a new savior and identified with a movement free from association with dictatorships. For that reason, if democratic government is ever seriously limited in the United States, it will not be under the name of Fascism or of Communism.

Leadership in a democracy. The genuine democratic leader attempts to reveal the real issues and the pertinent facts for deciding them. He realizes that although the thinking and learning of the masses move slowly, democratic ends cannot be reached more rapidly by undemocratic methods. If he is skilful in leading the people step by step and in formulating the next new idea for which the masses are just groping he becomes a hero. If his political "honeymoon" is not to end, he must then move on to an enlargement of the ideas or to a new one, ever keeping the people hopeful for the future and feeling that they are getting a gradually rising standard of living.

With the increased facilities of communication through the press, the radio, and the news reel, political thinking and feeling and the

formation of attitudes are greatly speeded up. Political propaganda disguised as news is thus able to reach greater masses more quickly. Unless these avenues of communication fall under a dictatorship, however, the public will probably be more likely to hear more than one side of an issue. As a result of the free conflict of ideas, the thinking and attitudes of the people may make real advances beyond their old beliefs and their old names for them. We must remember, however, that the development of public opinion is not a straightforward intellectual process. It is more likely to swing from one extreme to the other, being swayed by such catch phrases as "Tippecanoe and Tyler too" or "Keep cool with Coolidge." A recent study showed that large numbers of persons favored and said they would vote for certain policies or planks in a platform, but when asked to name their choice of party they rejected the party which had these planks. This indicates the part which prejudice plays in political life, but it also seems to indicate that some thinking is going on which eventually changes it.

PSYCHOLOGY OF RELIGION

Natural bases for religion. Religious beliefs and practices are outgrowths of psychological characteristics common in some degree to all persons. The first of these is a consciousness or feeling of inadequacy and dependency, particularly at certain times, with a tendency to submission to certain other persons. All persons meet difficulties and problems which they cannot solve. As children we depended on our father or our mother to overcome obstacles and dispel our fears. As we grow older, acquire experience, and develop insight, we become more self-reliant. There continue to be times, however, when we are baffled, awed, or hopelessly crushed, so that we tend to fly back to our childhood tendency to lay our troubles or thwarted hopes in the lap of someone who is stronger than we, and an idealized omniscient, omnipotent personality for this purpose gives us the greatest solace and inspiration. It is easy to respond submissively to and to worship and love or fear such a Personality, particularly since He is to us very much as we individually desire and conceive Him.

A second characteristic is the tendency to some form of aesthetic expression and appreciation. We not only tend to manipulate and construct, but we also tend to put into our fabrications some expression of feeling, or at least experience it vicariously in the work of others. This often is the sublimation of a thwarted emotion or urge such as fear, love, or anger. Thus we have religious music, paintings, and architecture, as well as impressive rituals and ceremonies. If there is not construction in materials, it may exist in day-dreams that often result in some expression recognized as religious.

There is also a tendency in human beings for self-assertion and self-perpetuation which leads to a hope of immortality. Religious beliefs are comprehensive enough to satisfy this hope, which tends to give completeness and meaning to life.

Lastly, man tends to react to life as a whole, to find meaning in it significant for his behavior; in other words, to integrate his experiences and his reactions to them. Religion gives him a direction star, a compass, or an anchor on which he can depend for consistency and stability. It gives him greatest or ultimate values and an object of worship around which he can integrate his personality.

The irrational and abnormal in religion. It is impossible to draw a sharp distinction between the abnormal and the normal in religion, and such a distinction would shift with time and changing beliefs. Burning witches because they were thought to be in league with the devil or have devils within them was thought normal at one time. All forms of zealous religious persecution might be classified similarly, but as a matter of fact religious persecution has never ceased in all its forms. The same is true of religious fetishes. There is less belief in charms, gifts and sacrifices to the gods, and religious ceremonies; but the consciousness of inadequacy and dependence still leads many persons to attribute to the Bible, prayer, and religious ceremony various powers that are not believed in by others. Thus it may tend to sanction irrational beliefs and prolong remnants of superstitious practices.

Psychological values of religion. We have already pointed out the strong basic tendencies leading to religious beliefs and practices. Such strong tendencies give rise to emotional tensions that yield satisfac-

tion and enrich life in their expression. Man has the neural equipment for emotional experience, and his life is empty unless this occasionally functions in some way. Religion often supplies sublimated and socially acceptable avenues for emotional experience and expression.

Religion gives supreme and ultimate values which help to resolve conflicts within the individual and lay the basis for an integrated personality. An individual may seize upon some particular religious concept, taboo, or practice, and become a zealot or fanatic; he may even become insane; but in the majority of such cases he was already psychopathic and only seized upon the religious activity as a rationalized and acceptable form of expression. For many more individuals, religion has served as an integrative, stabilizing, and even hygienic or therapeutic factor. Conversion is essentially a more sudden and even dramatic reintegration of the personality around some leader or ideal.

Finally, religion usually involves some moral code and gives sanction and force to it. There is no doubt that religious creeds and the church organizations growing out of them often hamper social progress in some of its details, but it is equally true that the finest ideals and fundamentally ethical forms of social relationship have had their roots in religious concepts of the good life.

Just as people differ greatly in other aspects of their behavior, so they also differ greatly in their religious concepts and behavior. Some tend more to be "rugged individualists," "tough-minded," or "hardy souls" who intellectualize their religion and thus are more likely to be introverted and depend on themselves through philosophy, science, agnosticism, New Thought, Mind-Cure, Gospel of Relaxation, or some other more or less self-sufficient intellectual process. Persons who vary toward the other extreme are the more emotional, extravert, dependent, and in need of a personal Deity. Great individual variations between these extremes make it impossible for all to have the same religious beliefs and behavior.

QUESTIONS

1. List some practical and effective steps you would take to reduce crime.

2. Describe some psychologically sound and practical methods of dealing with a person just released from imprisonment for five years.
3. Evaluate practices of penal institutions in dealing with criminals. What dangers attend evaluations (made by beginners in psychology) of such practices?
4. Prepare a test for measuring the reliability of testimony. How would you go about determining the effect of time on the reliability of testimony?
5. Read Münsterberg's *On the Witness Stand*. How would you go about determining whether Münsterberg's conclusions are valid?
6. What is a lie detector? What assumptions underlie the use of lie detectors? What factors influence their accuracy?
7. State some real political issues and analyze the fundamental conflicts underlying them.
8. What is meant by the statement that religion is seldom the cause of insanity, but often may furnish a focus for the irrational?
9. What is propaganda? What techniques are used by propagandists? Why should students of human nature be aware of these practices?
10. What message does the artist attempt to convey through the cartoon on page 433?
11. What is meant by "religious adjustment"? Of what value to society is religion? Of what value to the individual?
12. Name some other fields in which you can see possible applications of psychological interpretation.

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CHAPTER XX

PSYCHOLOGY IN MEDICINE

HEALTH AND DISEASE

Structure and function. The living organism, although made up of many interrelated cells, tissues, organs, and systems, functions as a unit. It makes adjustments in varied ways. The higher integrated adjustments or responses that give meaning to the whole organism, society, and the universe are often spoken of as mental functions or the mind.

Anything that changes bodily structure or its organization modifies to some degree the manner of its functioning. Disease, brain injuries, and shock are reflected in changed behavior. Growth and learning involve changes in structure and organization, which in turn result in changes in behavior. With reference to learning, it should be remembered that although learning does not affect structure in the same way that a brain injury does, nevertheless it results in a changed organization which is tantamount to an altered structure. Fatigue, sleep, and hunger are related to the body condition; consequently they too affect behavior. Environmental conditions such as temperature, humidity, movement of the air, and the like, alter behavior responses. Thus, some climatic conditions produce languor and drowsiness, while others are invigorating.

Health defined. Health is that condition of the total organism which gives to the individual the optimum freedom for carrying on all kinds of activities—mental and physical—both for the enjoyment that attends such activities and for doing the work that life in our changing society demands. Someone has said that, within the limits imposed by heredity, our enviroing conditions, and our past experiences, health affords us the opportunity of living, learn-

ing, and adjusting as we wish. By the same reasoning, it enables us to live and behave in a manner that conforms to our best ideals.

Health is both physical and mental. All physical health has its mental aspects, and all mental health has its physical basis. They are not separate. They are simply aspects of the whole. An "imaginary" disorder does not exist. Every ill, every pain, and every thought, deed, and sentiment has its physical basis in organic structure.

Recognizing that all symptoms and signs of dysfunctions have a real basis in body structure and organization, the modern physician treats the whole patient. The patient who, on the basis of a physical examination, has "nothing wrong with him" may have pronounced fears and anxieties which may require special treatment for a longer time than if he had broken a leg, contracted pneumonia, or developed smallpox. The treatment may involve medicinal therapy, physiotherapy, psychotherapy and suggestion, and reëducation.

We shall now consider some of the phases of medical practice in which the application of psychological principles is indispensable.

THE SCIENCE AND ART OF MEDICAL PRACTICE

The science. Modern medicine is highly developed, and the modern physician is a rigorously trained scientist who uses scientific instruments and procedures, and draws upon a comprehensive knowledge of a number of related fields. The invention of such devices as the stethoscope, cystoscope, bronchoscope, electrocardiograph, fluoroscope, microscope, and the x-ray has augmented the senses of sight and hearing and also made possible the examination of structures hitherto inaccessible. Thus the apprehension and early discovery of many common pathological conditions is a more or less routine matter. In addition, research workers in the fields of endocrinology, biochemistry, bacteriology, and the allergic diseases have discovered the nature of, and in many cases the therapy for, a large number of hitherto mysterious diseases. Hence the modern physician is well prepared, from the informational and mechanical side, for the practice of medicine.

The art. Medical practice is an art as well as an applied science, since it involves doctor-patient relationships upon which much of

the success of treatment depends. There is no laboratory substitute for these personal relationships, which should be built on a foundation of accurate knowledge of those aspects of scientific psychology which deal with the effects of illness upon an individual. As Dr. Paul Martini expresses it: "All medical thought must take into consideration the intimate interweaving of the physical and psychic processes which together form the mosaic of the disease state. Appreciation and understanding of this relationship constitute the culmination of medical knowledge."¹

Confidence. The basic relationship which the physician should attempt to establish is that of confidence. As Banister says: "Frequently more than half the battle is confidence in the doctor and belief in the treatment he gives. A bottle of medicine does good, quite apart from its purely medicinal properties, if the relation between doctor and patient is sound. As the doctor's visit acts as a stimulant, so does the medicine, for it is symbolical to the patient of the doctor. With every drop of medicine, he imbibes a portion of suggestion. Medicine alone may do good; if combined with belief in its efficacy, it will do much more."²

A large part of the doctor's influence is due to his prestige. It goes without saying that he should endeavor to maintain his prestige by practicing in accordance with the Oath of Hippocrates and the ethics of the medical profession, and by conducting himself with proper dignity, seriousness, and reserve.

An equally important element in a doctor's influence is his personality. Nearly a century ago, Dr. Oliver Wendell Holmes gave to physicians what is still psychologically sound advice, when he wrote:

And last, not least, in each perplexing case
Learn the sweet magic of a cheerful face,
Not always smiling, but at least serene,
When grief and anguish crowd the anxious scene,

¹ Paul Martini, *Principles and Practice of Physical Diagnosis* (edited by Robert F. Loeb, from the authorized translation by George J. Farber). Lippincott, 1935.

² Harry Banister, *Psychology and Health*, p. 113. Macmillan, 1935.

Each look, each movement, every word and tone
Should tell the patient you are all his own.
Not the mere artist, purchased to attend
But the warm, ready, self-forgetting friend
Whose genial presence in itself combines
The best of cordials, tonics, anodynes.

On occasion, the doctor will find it necessary to be a diplomat, an autocrat, a confidant, or a chief sympathizer of the patient, as well as his friend.

Psychology in diagnosis. The methods currently used by physicians in obtaining information from their patients are skillful applications of psychological principles. The physician chats with his patient about impersonal or perhaps personal matters, thus putting the patient at ease, while he observes overt expression, which is in some degree a measure of emotional condition. He pays particular attention to the stream of mental activity, noting whether or not there is disorder. These observations are in addition to the routine physical examination and the medical case history. The entire course of therapy is determined, often, by the information the physician obtains by such methods. He will decide just how much the patient should be told about his condition, and whether it will be necessary to use flattery, threats, or some other method to get the desired results.

In making a diagnosis, it is important that the physician should know the patient's attitude toward his disease. Frequently the patient's mental attitude intensifies his symptoms, and the physician may be led to believe that the disorder is more serious than it actually is. To make a correct diagnosis, the physician should isolate built-up attitudes. Unfortunately, many physicians have neither the training nor the inclination to do this.

Psychology in prescribing treatment. In deciding upon the proper treatment, the physician must keep in mind why the patient came to him, his hereditary background, his home environment, his developmental and medical history, his economic status, his hopes and ambitions, sorrows and joys. In addition to administering drugs, the physician will guide and suggest; he will explore and

rearrange social settings; he will prepare the patient and the conditions that will facilitate the effectiveness of suggestion and education. All this implies that the physician has a thorough understanding of normal behavior and of the differences in individuals. While some persons would maintain that he is only exercising common sense in such an approach, it cannot be denied that he is also making use of sound principles of psychology.

PSYCHIATRY

The branch of medicine in which psychology is employed to the greatest extent is the new field of psychiatry. It is a well-known fact that a relatively large number of people suffer from mental disturbances, which range from simple neuroses like a "nervous breakdown" to the several types of psychoses or extreme mental abnormalities; yet it is only in relatively recent years that serious attempts have been made to study and understand these diseases.

Psychologists have made valuable contributions to the clinical, diagnostic, therapeutic, and taxonomic classificatory aspects of psychiatry. They have also done considerable work in publicizing the nature of the problems and in creating a wholesome public attitude toward progress in this new field. However, the work already done amounts to but a beginning.

Nature of psychoneuroses. The psychoneuroses have been defined as "personality disorders in which instinctive and emotional difficulties are manifested under the guise of apparently unrelated mental and physical symptoms." The average physician and student of human behavior has an inadequate background in both theory and practice for dealing with cases of psychoneurosis. Too often wrong diagnoses are made and improper treatments prescribed. Not infrequently the cases are dismissed with no further comment than that the trouble is "imaginary." The patients usually go from physician to physician. They try various diets and mechanical treatments. One physician may diagnose a case as an ulcer of the stomach, another as cancer, and another as a toxic condition. Finally, the patient hears of a psychiatrist or a "mental clinic." He goes to it as a last resort.

A study of obsessions, compulsions, hysterias, anxiety neuroses, and complexes—their mechanism, the manner in which they arise,

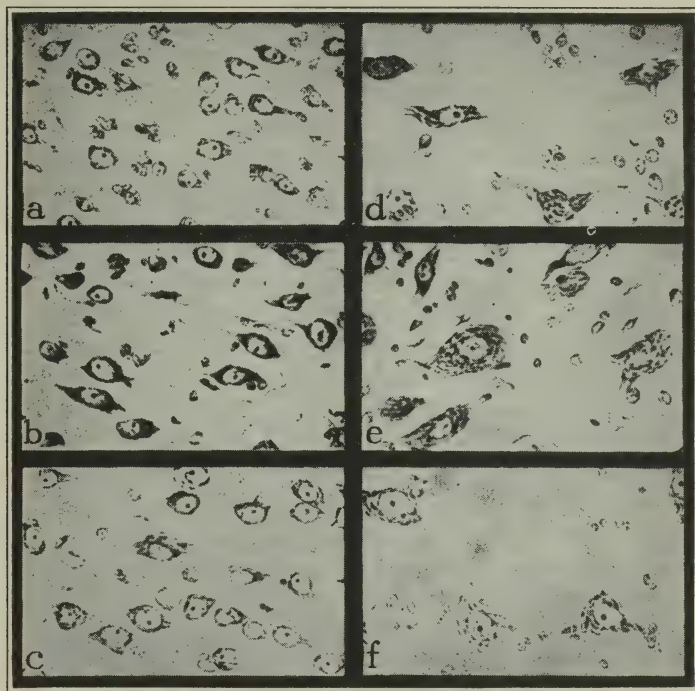


FIG. 37. SHOWING THE EFFECT OF FEAR IN RABBITS ON THE CEREBRUM AND MEDULLA

(a) Normal rabbit cerebrum; (b) cerebrum from rabbit frightened once and immediately killed; (c) cerebrum from rabbit frightened once and killed at the end of six hours.

(d) Normal rabbit medulla; (e) medulla from rabbit frightened once and immediately killed; (f) medulla from rabbit frightened once and killed at the end of six hours.

Courtesy of George W. Crile, M.D., Cleveland, Ohio

and the factors by which they are perpetuated—reveals that fear in one form or another is usually the underlying cause. The obsessions arise from mental conflicts and they develop into complexes.

These fear complexes are in conflict with the rest of the personality. They are in a sense dissociated from the main stream of consciousness. When a physical examination reveals nothing organically wrong that would account for a patient's symptoms, the root of the trouble may be a fear based on an idea system or buried complex that was built up in the subconscious.

These fixed and associated ideas may result in feelings of depression, fear, excitement, nervousness, and irritability. Certain bodily reactions such as cardiac, vasomotor, respiratory, intestinal, and digestive disturbances become associated with or conditioned by sensations, perceptions, images, and thoughts. The mental reactions or symptoms are reproduced whenever their physiological associates are brought into the field of conscious experience. It matters little whether this phenomenon is explained as a conditioned reflex, or association; the point to bear in mind is that conscious experience, knowledge, and insight may exert a tremendous influence on the digestive and other systems.

Many of the psychoneuroses are of the "vicious circle" type.¹ One ailment aggravates other conditions, and these aggravate still others, until the disorder becomes progressively worse. Let us take the case of a patient whose chief topic of conversation is his own symptoms. He is always suffering from pain, and unable to eat certain foods. He tries one physician after another, oftentimes with only temporary improvement following such consultations, until finally he imagines that he has cancer, a dilatation of the stomach, tuberculosis, or insanity. When a thorough examination reveals no such organic trouble, the patient is regarded as neurotic. The more he thinks of his condition, the more he imagines that something is radically wrong with him, and the greater becomes his fear and the more fixed his complexes. His whole personality must be treated by the psychiatrist.

¹ *Example:* Anxiety → dyspepsia → gastric atony or weakness (loss of tone) → visceroptosis (downward displacement of abdominal viscera) → intestinal stasis or slackening or arrest of the blood current due to abnormal resistance of capillary walls → toxic condition → glandular disturbance → more anxiety → more dyspepsia, and so on.

Causes of mental disorders. Mental disorders constitute atypical forms of behavior. The causes of any single mental disorder range from one to many factors. A single factor, such as birth injury to the head, or a set of conditions may produce the resulting disorder. Sometimes the causes are primary. In other instances they may be secondary. We shall consider here some of the major causes of mental disorders and behavior aberrations.

*Heredity*¹ is a primary determiner of body structure and obviously a conditioner of all behavior. A relatively large number of our feeble-minded have inherited the defect. Amentia or feeble-mindedness "runs in families," although numerous other conditions operate to cause its appearance in the best of families. When it is hereditary, the defect is inherent in the genes. Tuberculosis and insanity (a sociological-legal term) are not inherited, although a structure predisposed to such diseases and disorders is thought, by some, to be inherited from parents suffering from such maladies. Children of neurotic parents often have a greater than average tendency to develop some nervous ill, but if they take the proper preventive measures—engage in enjoyable work, cultivate a wholesome attitude toward life, have a hobby, and cooperate with others—they may not develop any ills of this type. The same is true of children of tuberculous parents. If proper hygienic measures are taken, the children need not contract the disease, or, if they do, they will soon overcome it.

Many *prenatal factors* operate to cause abnormalities, or to predispose of various disorders. Glandular imbalance, malnutrition, disease toxins, or syphilis, in the mother, may interfere seriously with the developmental processes of the prenatal child and predispose it to various behavior disorders.

The *birth process* is often an ordeal for the child. Not infrequently the child is seriously injured. The brain itself may be injured. A hemorrhage within the intracranial space may interfere

¹ Neither heredity nor environment determines any structure or behavior by itself. These factors always operate together or in *herediviron* as it has been called. It is true, however, that in such amalgamations heredity plays certain major rôles and environment other major rôles. The genes in the chromosomes contain the determiners of traits that are hereditary.

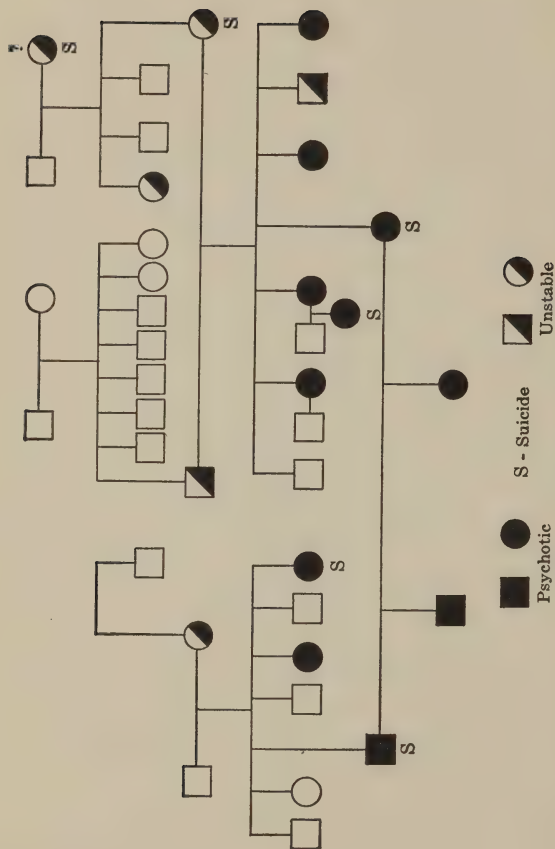


FIG. 38. CHART OF A PSYCHOTIC FAMILY, SHOWING THE INHERITANCE OF EMOTIONAL INSTABILITY ¹

¹ Adapted from George W. Henry, *Essentials of Psychopathology*, p. 11. William Wood and Company, 1935.

with brain development unless proper absorption of blood takes place. Such birth injuries may result in feeble-mindedness or other serious behavior disorders. The modern physician is able to lessen greatly or prevent serious developments following head injuries incident to birth. The blood in the intracranial area is drained off with the result that the absorption powers are not overtaxed. Normal mental development usually ensues. Nearly all parents of children having mental or physical defects present from birth blame the use of forceps and console themselves with the phrase "birth injury."

Infections of the brain and membranes are among the more specific causes for mental disorders. Encephalitis (an inflammation of the brain itself), syphilitic infection, and meningitis (an inflammation of the membranes surrounding the brain), frequently result in mental disturbances.

Toxic or poisonous substances often develop in the body as the result of improper elimination. Various drugs and alcohol in excess may cause similar toxic disturbances and resultant behavior disorders.

Brain tissues may be destroyed through gross *brain injuries*. Brain tumors and cerebral hemorrhages likewise cause mental disorders.

Glandular disorders, or dysfunctions, are factors which influence health, growth, and behavior. Inadequate secretion of the thyroid gland causes the individual to be dull, listless, or lethargic; an overactive gland produces restlessness, irritability, and overactivity.

Chronic infections, such as tonsilitis, sinus infection, appendicitis, gonorrhea, and abscessed teeth, are directly or indirectly frequent causes of disturbances in personality development and of mental disorders.

Mental traumas or psychic shocks such as those resulting from unfortunate love affairs or a sudden death of a loved one may result in mental disturbances, as may also worry and anxiety over prolonged periods.

Training, attitudes, and normal family social life, especially in the early years of childhood, are of utmost importance in preventing personality maladjustments.

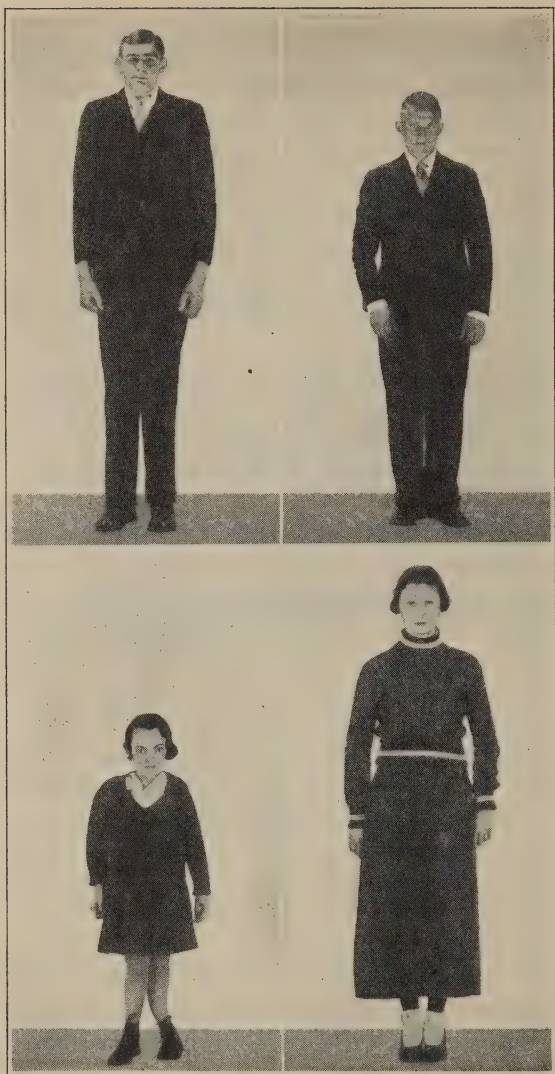


Fig. 39. SHOWING THE EFFECT OF PITUITARY DISTURBANCE ON GROWTH

Above, Giant and man of average stature; *below*, dwarf and girl of average stature. Courtesy of Charles S. Little, M.D., Letchworth Village, Thiels, N. Y.

Various *afflictions* and abnormalities such as deafness, bodily deformities, birthmarks or other serious blemishes on the face (including the growth of hair in the case of women) are potent in causing worry, anxieties, or worse mental conditions.

A scale of psychoneurotic disorders. In addition to the foregoing, fatigue, due to exhaustion of body cells, is often a cause of psychoneuroses. Dr. Edward Spencer Cowles¹ offers a convincing interpretation. He charts the fatigue of cells, with the figure 100 representing the energy of the healthy brain cells and zero representing absolute exhaustion. In the zone between 100 and 80 units on the scale, the normal individual is only slightly irritable, emotional, and maladjusted. While many little things irritate him that did not do so previously, he is able to maintain poise. Usually a brief vacation brings him back to a normal healthy condition. The second zone lies between 80 and 60 on the scale. Here, obsessions and fears predominate in the patient's experience, and in most instances he becomes afraid of his own sensations. A barrage of impulses rushes over the threshold of consciousness, with the result that he becomes very irritable, nervous, emotional, and upset physically. Although he may recover without medical attention, recovery may be hastened by proper diagnosis and treatment. The zone between 60 and 40 is represented by melancholia; the zone between 40 and 20 by manic depressive psychosis; and the zone between 20 and 0 by the complete exhaustion cases.

Diagnosis of psychoneuroses. Some of the methods used in psychiatric and neurological work are similar to those of the clinical psychologist. Below is an outline of a case history for diagnostic and minor treatment service which is used in the children's clinic at the College of Physicians and Surgeons in New York City.

OUTLINE OF HISTORY FOR DIAGNOSTIC AND MINOR TREATMENT SERVICE

I. IDENTIFYING DATA

Name, address, sex, age, school and grade, number of older and

¹ Statement made in an address on "Some Defects of Our Educational System," delivered at New York University, March 18, 1933. Also compare *Progressive Medicine*, vol. 1 (March-April, 1937), pp. 3-7.

younger siblings; nationality and occupation of parents; telephone number; name and relationship of informant.

2. PROBLEM

Enumerate immediate difficulties and their duration. Outline less emergent or previous problems. Discuss briefly these problems from points of view of genesis, setting, importance. (One asks the client, "What is worrying you?" and then allows, as much as possible, the story to develop itself.)

3. CHILD'S PERSONALITY, BEHAVIOR, SCHOOL ADJUSTMENT

Look for asocial, antisocial, or immature characteristics. Is child especially precocious in any way; e.g. in sex interests or activities? Are child's recreational interests compatible with age and background? Is school grade adequate for age and possible intelligence? Are there special difficulties of adjustment at school? Have there been changes in personality development of intellectual functioning?

4. MEDICAL HISTORY

There are two important considerations here: (1) earlier medical experiences which have left their impress on personality and behavior, and (2) existing organic and functional disturbances, which create behavior problems. The earlier experiences to look for are: (a) congenital and developmental variations, (b) birth injuries including mild cerebral hemorrhages, (c) lues, (d) disturbed nutrition and feeding habits, (e) convulsions, (f) protracted illnesses, (g) accidents, (h) encephalitis, (i) meningitis, (j) infantile paralysis. Existing medical conditions having behavior correlates may be: (a) chorea, (b) epilepsy, (c) post-encephalitis, (d) cerebral tumors, (e) fatigue and malnutrition, (f) glandular and chronic focal infections, (g) physical blemishes. Also go into early history: age of sitting up, walking, talking, in order to establish some idea of development and intelligence.

5. PARENTS AND THEIR PROBLEMS

Look for some of the more important parental situations upsetting children's development; e.g. (a) poor, irregular, and inadequate discipline, (b) overattachment or repudiation by one or the other parent, (c) triangular relationships between child and parents, (d) incorporation of child into parents' complexes or neuroses, (e) use of child by parents to work out parental ambitions, (f) general emotional upheaval in family, producing terrific wear and

tear for child, (*g*) insecurities for child connected with step-parent or foster parent relationships, (*h*) conflicts of mores of different generations, (*i*) use of child as battleground for parents' differences. (*j*) Are parents reacting to child in terms of their parents' attitude toward them?

6. FAMILY SETTING

Is family seriously handicapped by a neurotic history? Are there relatives living with parents and do they complicate the family relationships? Is family suffering from insecurities related to broken homes, a step-parent, alcoholism, economic or religious problem, invalidism, racial differences, lax or rigid discipline, sexual irregularities of any of its members, overcrowding, frequent change of address?

7. SIBLING RELATIONSHIPS

There are two series of reactions here: One deals with the parents' relationships to different children in the family; the other, with the children's relationship to each other. In the former group of possible reactions look for: favoritism toward or pampering of one child, shifts in affection with the arrival of younger children, identification between parents and special children, suppression or exploitation of any child, subordinating the interests of other children to poorer or better endowed child, stressing of sex differences, comparison of children, over or under evaluating one child's capacities; e.g. in connection with earning money or making progress in school. In relationship of the children to each other look for evidence of: jealousy, rivalry, identification; feeling of superiority or inferiority regarding intelligence, abilities, physique; aggressiveness, domination, supineness, protectiveness, cruelty, sex experimentation between the children.

8. NEIGHBORHOOD, SOCIAL, AND ECONOMIC CONDITIONS

Is misbehavior part of social setting; gang activity, low-grade neighborhood, foreign standards of living and traditions, overcrowding, lack of recreational opportunities, absence of religious ties, presence of speakeasies, inferior movies, general delinquency. What is physical set-up and routine of household: irregular sleeping and eating habits, poor supervision, untidiness, noisiness, overcrowding? Inquire regarding recreational opportunities in neighborhood: settlements, parks, clubs, scout organizations, church activities, school playgrounds, libraries.

9. ATTITUDE TOWARD CLINIC

From whom did client learn about clinic? How was clinic interpreted to client? What were client's initial reactions to clinic? Have they changed during contact with clinic?

10. SUMMARY

Outline the nature of problems: the outstanding cause of them, psychiatric motivations underlying these causes, and possible constructive material upon which to build a treatment program.

It will be noted that, apart from the purely medical items, the data called for in the case history are the familial setting, the nature of discipline used, neighborhood conditions, and the social and economic status of the patient. All these are materials of psychology in its individual or social aspects, and all are significant in determining possible treatment. The outline is also of significance with respect to the legal applications of psychology, especially in cases of juvenile delinquency.

The psychiatrist does not center his whole attention on the patient's symptoms. He makes a general physical examination, using such detailed and specific laboratory tests as may be needed, but he does more than this. He studies the various reflex symptoms, conducts a mental examination, and secures what data he can about the patient. In brief, he considers the total organism in all its mental, emotional, physiological, and pathological aspects. With a knowledge of both the normal and the abnormal, he attempts to diagnose the case before him and to prescribe the indicated therapy.

Treatment of psychoneuroses. In the treatment of the psychoneuroses, certain general procedures apply. These may be summarized as follows: the general bodily condition is built or toned up, and any existing physical defects, foci of infection, or glandular disorders are corrected; the emotional reactions are brought within a normal range; corrective changes in both the social and physical environment are suggested; habit formation and reëducation are often directed. In brief, the procedures are medication, suggestion, analysis, and education. Frequently the patient begins to improve the moment he realizes that he can be cured; and the moment that he believes himself well, he is cured.

Neurotic individuals often present a serious problem when they are ill. They may become hysterical and overpity themselves. Many of them have an extreme fear of death. The disorder is frequently aggravated in such cases by the loss of sleep and mental excitement. Psychological treatment rather than hypnotics is indicated. Despair and despondency must be fought with all the arguments a doctor can bring forth. Likewise, particular attention must be given to the nervous manifestations which are often present in serious illness. The sick person is likely to be irritable and peevish. Everything possible must be done to improve his morale. Nothing cheers a patient more than the realization that the doctor is interested in him; that he is not just another patient.

Considering the mental strain of the patient, the doctor should be careful as to what he says and does at the bedside of a sick person. For example, the doctor's facial expressions when feeling the pulse may convey to the patient the impression that the case is serious. The way in which the thermometer is looked at, or the temperature chart is examined, or members of the family are addressed, conveys impressions to the patient. But such information is not intended for the patient, because the inadequacy of his background and his illness are both likely to lead to erroneous interpretations. Moreover, the use of medical terminology is necessary to keep facts of serious nature from the patient.

The physician who would be successful in the treatment of the psychoneuroses or other mental disorders should possess sufficient knowledge and training in psychology and psychiatry so that he can adequately cope with the problems he will meet. In addition to his medical knowledge, he should possess the worldly wisdom and experience that enable him to understand other people easily and to enter quickly into satisfactory emotional relationships with them. It goes without saying that he should himself be a person who has a wholesome personality and who has trained himself in self-control. The physician who undertakes the direction of his patient's emotional disturbance should not exhibit fluctuating tendencies. In his dealings with his patients, he must be firm and consistent. His bearing and behavior should inspire every patient with confidence and courage.

Things do not happen by chance in human life. Every response is a reaction to something. Since there are as yet many unknowns in every situation that elicits behavior, it is exceedingly difficult and often impossible to diagnose accurately what conditions produce any given set of reactions. Exactly the same situation would invariably produce the same response, but since the individual organism and the environment are constantly changing, diagnoses are only approximate. Discovery of the exact causes of psychoneuroses is often extremely difficult. However, the better informed and educated the physician, the greater will be the accuracy of the diagnosis, the efficacy of the treatment prescribed, and (where possible) the control of the conditions that produced the psychoneurosis.

SUGGESTION AND MENTAL HEALING

Suggestion. When properly employed, the method of suggestion is invaluable in medicine. It is effective only if the patient has some mental set or attitude that will make him accept commands without reflection. It presupposes confidence of the patient in the physician, and willingness to be directed by him.

Suggestion provides no cure for definitely pathological ailments, but "the mind can cure what the mind has caused." Mental disturbances sometimes start with some moody experience when the individual is fatigued, discouraged, or grief-stricken. Once started, they persist and become emphasized out of proportion to the rest of the person's mental life. In a large number of such cases, a knowledge of the mental facts and laws involved will be sufficient to keep the individual in balance. In other instances, lack of self-confidence, inability to grasp relationships, or strong emotions may create conditions where rational discussion must be superseded by other procedures. For such cases, the use of suggestion is indicated.

Many of the current practices in so-called mental healing are either directly or indirectly harmful in organic diseases. However, in the hands of medical practitioners who are specially trained to differentiate between functional and organic conditions, mental healing is a useful part of the physician's armamentarium. Suggestion and faith

do not kill germs. They merely aid in toning up the body, strengthening morale, and indirectly helping the body to win the battle.¹

Quacks. Perversions of mental healing persist in spite of the advances in science. Just as the primitive medicine man applied the psychological method of distracting the attention of his patient, so do the modern healers resort to the same general technique. The medicine man did this by dressing fantastically, talking to the patient, and assuring him that he was not ill. Upon completion of the treatment, the patient was given a charm to be worn which was to drive off the evil spirits. The healers of today, in a rather dignified way, use the same general methods in giving treatment.²

The mind of the patient must be ready to react to the suggestion treatment. The stimulus suggestion of the healer produces a definite response which in turn becomes the stimulus that elicits further responses. When the patient has complete confidence in the healer and his ability to effect a cure, and when there is no definite organic condition that needs treatment, there may be favorable results with such methods.

Numerous forms of pseudo-medicine are being practiced today, legally or illegally. That some of these cults or "isms" do good cannot be denied, but the harm, direct or indirect, is almost incalculable.

Mesmer, an Austrian physician, was one of the most interesting quacks of history. From a priest he learned the efficacy of suggestion in curing disease. He learned also that similar results could be obtained by personal contact. He assumed that magnetic force was an inherent quality of human flesh, and that the action of one personality could be made to bring about desired results in other personalities. He persuaded people that he was peculiarly equipped with this mystic power.

Despite his outward appearance of sincerity and earnestness, he was little more than a commercial charlatan. Like the quacks in psychology of today, he resorted to all the "tricks of the trade."

¹ Students who are interested in faith cures are referred to E. S. Cowles, *Religion and Medicine in the Church*, Macmillan, 1925. When psychiatrists work in coöperation with an understanding clergy, the results are often most gratifying in functional conditions.

² Cf. H. W. Haggard, *Devils, Drugs and Doctors*. Harper, 1929.

His office was furnished with the finest furniture. Varicolored lights were used to produce the optimum effect; soothing strains of music and incense filled the air. The magnetism of his body was enhanced by his rich and mystic robes. In America, a Phinneas Quimby became a noted exponent of what came to be known as Mesmerism as a panacea for all ills. It was left for the English psychiatrist Braid, years after Mesmer's Paris seances, to take the phenomenon with which he worked out of the realm of charlatanry and explore its possibilities under the new name of hypnotism.

It is estimated that 36,000 medical charlatans are practicing in our own country, primarily on the uninformed and credulous, and that American consumers pay \$125,000,000 annually for these services. Such practices constitute a social problem of great magnitude. Students of psychology may well consider the sources of the charlatan's power, the types of appeals used, and the efficacy of methods used in fighting these quacks. Here are psychological problems that challenge all students of applied psychology.

MEDICATION

Drugs and potions. Long before there was a science of pharmacology or a knowledge of the specific actions of various drugs, old women, healers, and doctors concocted all sorts of strange remedies. In earlier times, many of the concoctions were made so foul that, according to the superstition, the spirit of the disease or demon could not exist in the same body with the medicine. Then there developed medicines which gave the patient a feeling of warmth and of stimulation almost immediately. This probably increased the patient's confidence and helped materially in controlling his disorder. Alcohol was one of these remedies, since it has no specific virtue in the control of any disease. Still later, specific remedies were compounded.

Psychological effect of drugs. In compounding and dispensing medicines, pharmacists and physicians must take cognizance of both the physiological and psychological results desired. Capsules, tablets, and pleasant-tasting mixtures of the proper size and color, administered in right dosage at proper intervals, are designed to bring about the desired reactions.

Many of the substances that have been used as remedies depend upon their appeal to the imagination for the healing virtues that they are believed to possess. The belief is still widely held that drugs in some mysterious way are a necessary part of the treatment of all diseases. Ignorant and superstitious people are dissatisfied with any treatment by a physician unless it includes a bottle of medicine or a box of pills. They may believe also that the physician does not know his business if he does not prescribe. In such cases, it would be judicious for the doctor to leave a prescription calling for an inert mixture.

QUESTIONS

1. Collect case evidence which shows that the weather influences one's behavior. Describe a sound experimental technique for measuring the influence of the weather on sick patients.
2. Make a list of the activities of the medical practitioner. Group these activities into from three to seven major categories. Tell how the facts and principles of psychology apply to each of these major fields of activity.
3. Why are the physician's prestige and personality of great importance?
4. How should a physician conduct himself at the bedside of a sick patient? Why?
5. Let a committee of five members of the class make a community study of irregular medical practices and report the findings to the entire class.
6. What have you learned in this course that would help a dentist in handling his patients more intelligently? That would help a nurse in learning her job? That would help in her practice?
7. What are the chief causes of mental disorders? How is modern science helping in the prevention of many cases of abnormality?
8. Why is the attitude of the patient always an important factor in recovery? Do you believe that the physician, dentist, and nurse should strive to build attitudes in their patients? Why or why not?
9. What are the merits of the following: mesmerism; faith healing; imaginary ills; psychoanalysis?
10. Show that chronic criminals are sick in both mind and body. How may scientific medicine help prevent the development of criminal behavior?

11. What is psychotherapy? Why should psychotherapy be used by all physicians?
12. Civic-minded individuals in your community wish to induce the entire school population to submit to immunization against two or three well-known diseases. There is some reluctance on the part of some children and their parents. Tell specifically how the psychologist would get the desired action.
13. What is a "vicious circle" as the term is used in medicine?
14. How may deep-seated fears be overcome by the psychologist or psychiatrist?
15. What is a psychiatrist? Is he a physician? Why is psychology such an important part of his equipment?

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CHAPTER XXI

PSYCHOLOGY IN EDUCATION

We are familiar with the manner in which psychology is used in newspapers and magazines. The advertisements of various products utilize psychological principles for securing buyers. The editorial columns apply psychology in their attempt to develop public opinion. We cannot miss certain items on the front page because of headlines which catch the attention. We start reading the column and soon discover that it holds our attention because the writer knows how to interest us.

Merchants, shop owners, artists, dentists, physicians, clergymen, and politicians likewise employ various principles of psychology to further their enterprises. The merchant uses psychology to stimulate sales; the industrialist, to increase production or reduce the costs of operation, or both; the artist, to create pictures or sculpture which will arouse aesthetic feeling; the dentist, to prevent or control fear; the physician, to bolster the morale of his patient; the clergyman, to develop religious behavior; and the politician, to secure a following.

THE EDUCATIVE PROCESS

Similarly, psychological knowledge and techniques have been very successfully applied in the field of education. From time immemorial, parent and teacher have used many of its fundamental principles in stimulating, restraining, directing, and controlling children.

Objectives. Teaching is concerned with the task of stimulating and guiding the child so that he will develop (1) the purposes, creative urges, and interests which he as an individual deems important, and (2) the skills and habits, knowledges, attitudes, creative expressions, conduct, interests, and reasoning ability which

society regards as important from the standpoint of the individual's ability for self-direction and social functioning in a changing society.

Since education, in terms of the learner, implies wholesome and desirable growth, educational psychology aims to equip the teacher with some of the attitudes, knowledges, and skills for promoting growth. It also aids parents by helping them develop in children the kinds of growth desired.

Growth and learning. Growth has a physiological aspect since the human body is constantly in the process of change. A process of inner maturing or developing, owing to nutrition and stimulation, is constantly going on. The babe grows into the child, the child into the adolescent, and the adolescent into the adult. These natural processes of growth, which involve a change in structure with resultant mental functions, are often spoken of as maturation.

The child develops or matures according to natural laws, and to force or "hothouse" him beyond his level of maturity is to commit a psychological offense. This fundamental principle of growth is violated in innumerable instances each year. Children are taught to walk, when a few days or weeks later they would walk without instruction. They are taught to read at six when they could learn much more easily and better if taught at seven or eight. Furthermore, in such cases, both child and teacher are subject to greater strain because the child's immaturity interferes with ready mastery and necessitates an undue amount of drill. The immature learner makes more mistakes, encounters greater difficulties, and experiences more failures. A loss of interest in school activities and a dislike of the teacher are frequent outcomes. At the same time, the work of the teacher is made much more difficult because the activities are not properly adapted to the child's level of maturity, intelligence, and experience.

The same principles hold even at the college level. Thus the youthful but brilliant college student may learn Greek and physics at seventeen, but because of intellectual immaturity may flounder in philosophy, lose his balance in certain social studies, or embrace extreme theories, doctrines, or points of view. A few years later, philosophy becomes easy and meaningful, and extreme social,

political, and economic doctrines are subjected to critical analysis. No longer are they viewed as panaceas for all the ills of society; rather, they are regarded as viewpoints of theorists and as such, possibly right, possibly wrong. In other words, the mature student, instead of accepting theories uncritically, will maintain a reasonable doubt until their validity is tested by all available means.

To summarize: in their broader aspects growth and learning mean the same thing. Whether growth refers to maturation changes or to learning changes, the result is the same—an altered structure and changed functions. The promotion of growth is the aim of teaching, and the kinds of growth to be promoted, or the outcomes to be sought, are many and diverse. Intellectual, social, moral, emotional, aesthetic, and religious learning there must be. All these learnings equip the individual for self-direction. In brief, the individual grows, but he should also develop the ability to grow. The resultant mental alertness will in turn find expression through intelligent purposing, creating, appreciating, thinking, and living.

Process and product. We may better understand how psychology can be applied to education if we start by defining terms and analyzing the work of the teacher. Sociologically, the purpose of education is to conserve, transmit, and enrich the culture of the group. Education for the individual aims to develop in him the ability to make all kinds of needed and desirable adjustments for living in a changing social order. Thus education, from the point of view of society and of the individual, is not only a process but a product. It is a process since it goes on continually in the life of a culture and in the life of the individual changed by each new experience. As a product it is the changes wrought by the experiences.

The teaching process. The teaching process is concerned with such things as educational means, curricular materials, methods, and activities, which are manipulated for the purpose of securing the desired outcomes.

The child (or learner) becomes the center of all educational efforts. For the benefit of children and of the society of which they are a part, we have schools, in which the teacher is naturally the most important factor in promoting pupil growth. The curricular

materials, projects, and methods constitute organizations of means which by experience or experiment have been found most successful in producing the kinds of conduct that the social order deems essential. The learner must be brought into contact with these means in some way, and again experience and experiment have proved that some methods of effecting contact are better than others. A good teaching personality and socially valuable curricular materials, organized in the form of problem-solving units and adapted to the individual needs and abilities of learners, are indispensable for the best results.

PSYCHOLOGY OF LEARNING

Principles of learning. Psychology helps educators to understand the nature of the learning process and the factors that influence pupil learning, to analyze the mental operations of learners, and to comprehend the specific problems connected with learning the different subjects or activities. Through intelligent application of sound principles of psychology, the efficiency of the school during the past forty years has greatly increased. Some of the most important principles of learning follow.

1. *Learning takes place most readily and economically when the learner has a goal.* On the basis of this principle, educators are now directing children and utilizing curricular materials and methods in such manner as to insure that pupils have goals, and that the means of education are conceived in relation to the goals. In other words, if learning is to proceed with economy, pupils must have purposes which are primarily their own. The more nearly the realization of a goal satisfies some felt want, need, or desire, the more potent will the want be in motivating behavior. Pupil purposes are potent factors in learning, serving a dual function. They are drives to action, and they give direction to behavior. A well-balanced, intelligent, and socially-minded student can accomplish surprising results if he has a definite goal and a dynamic purpose.

2. *Learning is organizing.* To the extent that the pupil organizes his material into significant relationships, "putting together things that go together," and "keeping apart things that do not belong

together," he learns with economy. The student who outlines his lessons so that the relationships are evident learns better than the one who makes no attempt to organize the material into meaningful relationships. The outline technique is but one of many that can be used, and one which shows conclusively that learning is easy when the learner understands. It is axiomatic that a student will not forget readily facts or relationships he understands. Assuming a definite goal and a dynamic purpose, organizing facilitates learning and retention.

3. *Other things equal, learning is facilitated when the learner meets with success in reaching the goal.* Responses are learned as they function in taking the individual toward his goal. Such learnings are also more potent in influencing subsequent learning. Nothing succeeds like success, and nothing inhibits like failure. In recognition of this principle (which has its limitations and exceptions) educators are setting up educational situations that are success-bringing.

4. *Learning one subject affects the learning of other subjects.* Under certain conditions and circumstances considerable saving may be effected, whereas under other conditions interference may actually result. Learning Italian, for example, may be much easier because the student had previously mastered Latin; but the study of Pitman shorthand may interfere with the subsequent learning of the Gregg system. By utilizing certain well-known facts of psychology the teacher attempts to set up situations that increase the amount of transfer. If a subject is taught in such manner that the pupils see relationships between subjects or activities, or if the learner is taught to generalize his experience and to apply the generalizations to specific instances, greater transfer is obtained. In brief, transfer depends on the method of learning (or teaching) as well as on the similarities between the activities or subjects. The teacher must make sure that pupils observe the relationships and form the habit of generalizing experience. He must teach so that his pupils gain power.

5. *Correct and attentive practice under favorable conditions is most important, but practice for the sake of practice does not insure*

effective learning. Repetition is most valuable when properly motivated, organized, and purposeful.

Analysis of learning. Much insight into pupil learning may be obtained by analyzing the learning when it is in operation. Studies have been made of the relationship between (1) eye movement habits and reading efficiency, and (2) kind of movement used in handwriting and quality of the product. Unless an analysis is made of the operations used by the pupil or the teacher, the complexity of the operations involved in learning, for example, to add 196, 280, 473, and 508, cannot be fully appreciated. An analysis of the mental operations involved in performing the following exercises will reveal to the students of psychology how the mind works:

Punctuate so as to make sense: *That that is is that that is not is not is not that it it is.*

Answer the following: *Which is heavier, ice or water?*

Interesting problems grow out of the learning of each of the school subjects. The better the teacher understands the psychology of learning these subjects, the better he can direct the education of his students. Likewise the college student can improve his learning of psychology and all other subjects if he will apply to his learning situations the concrete findings of psychologists.

MEASUREMENT

The aims and goals of education are determined by our educational philosophers. For practical purposes, the goals or outcomes sought are translated into behaviors to be developed: conduct, appreciations, and standards of value. Like every other professional group, educators are constantly evaluating the results of their efforts. For centuries, evaluations have been made, but because of the variability of human opinion and judgment, psychologists and educators set about developing and standardizing tests that would enable any classroom teacher to get a valid measure of the child's achievement. Within a score of years all kinds of achievement, diagnostic, prognostic, survey, and performance tests were

invented and administered to thousands of school children. Then critics began to question the way things were going. Everybody was testing or being tested. Thousands of dollars were spent for test materials. Close observers found that, in practice, tests were actually determining the curriculum and teaching techniques of many schools. Teachers wanted their pupils to rate *equal to* or *better than* the average for the country, and consequently drilled their pupils in the kinds of material used in such tests. Coaching became a common practice, with the result that the most important psychological outcomes—growth, conduct, wholesome personality, appreciations, creative ability, and values—were overlooked.

Evaluation. Educators and psychologists now realize the difficulties of measuring many of the most important outcomes of instruction, and a few believe that attempts to measure certain outcomes may even interfere with the learning. At all events, factual information is no longer regarded as being of primary importance. Numerous studies show that both high school and college students soon forget the knowledges acquired, but retain for a long time their attitudes, appreciations, and ways of attacking new problems and situations. In view of these revelations, teaching emphasis is coming to be decidedly less on knowledge, and more on important social outcomes.

Thus far in our discussion, emphasis has been on the limitations of measurement. Criticism was directed at the misuse of tests rather than at the principle of educational measurement, toward which a new attitude is now taking form, which avoids misplaced confidence, on the one hand, and cynical distrust, on the other. This attitude is soundly based on an understanding of the aims and values of education and the methods of testing. As a result, steady progress has been made in the refinement of methods of measurement. In the earlier days of scientific measurement the questionnaire method served a useful purpose, but it has now been superseded by more reliable and valid instruments. Among these are statistical procedures which have made possible many illuminating facts regarding common characteristics of a large sampling of individuals. Furthermore, penetrating analyses of mental proc-

esses of learners are resulting from more laborious and better controlled laboratory investigations and case studies.¹

Much improvement has been made of late in the testing of attitudes, in understanding of basic terms and concepts, and in application of facts and principles to new situations. The work of Lindquist at the University of Iowa, Tyler at Ohio State University, Thurstone at the University of Chicago, Allport at Syracuse University, and Thorndike at Teachers College supplies notable examples. This emerging science of measurement and evaluation is gradually becoming a valuable tool in the hands of the enlightened educator, who realizes that outcomes must be measured in the light of objectives and values.

SOME ILLUSTRATIVE TEST EXERCISES IN HIGH SCHOOL CHEMISTRY²

A. *A test for measuring knowledge of chemical facts and principles*

Directions.—The following exercises consist of incomplete statements, each of which may be completed by one or more of the words or phrases given below the statement. Place a plus sign (+) in the parentheses after those words or phrases which make the statement true.

Ions—

- a. Have the same properties as their atoms. ()
- b. Are electrically charged. ()
- c. Increase in number as the valence increases. ()
- d. Are produced by the dissociation of molecules of non-electrolytes. ()
- e. Have properties different from their atoms. ()
- f. Are produced by the dissociation of molecules of electrolytes ()
- g. Are produced by the process of electrolysis. ()

¹ R. W. Tyler, "Assumptions Involved in Achievement-Test Construction," *Educational Research Bulletin*, vol. 12 (Feb. 8, 1933), p. 29. Also: C. H. Judd, *Education as the Cultivation of the Higher Mental Processes*, Macmillan, 1936; H. E. Hawkes, E. F. Lindquist, and C. R. Mann, *Achievement Examinations*, Houghton Mifflin, 1936; R. W. Tyler, "Measuring the Results of College Instruction," *Educational Research Bulletin*, vol. 11 (May 11, 1932), pp. 253-260; and L. L. Thurstone and E. J. Chave, *The Measurement of Attitude*, University of Chicago Press, 1929.

² F. P. Frutchey, "Illustrative Test Exercises in High School Chemistry," *Educational Research Bulletin*, vol. 16 (May 19, 1937), pp. 122-126, 140.

- h.* Increase in number as the atomic weight of their atoms increases.....()

B. A test of knowledge of chemical terms

Directions.—Below is a numbered list of chemical terms arranged in alphabetical order. Following the list are definitions or descriptions of terms used in chemistry. Read each definition or description, decide what term it is, then place the number of the term in the parentheses after the definition.

- | | | |
|---------------|------------------|----------------------|
| 1. Amalgam | 11. Deliquescent | 21. Isomers |
| 2. Amorphous | 12. Efflorescent | 22. Isotopes |
| 3. Amphoteric | 13. Electrolysis | 23. Monel metal |
| 4. Anhydride | 14. Electrolytes | 24. Neutralization |
| 5. Anions | 15. Equation | 25. Non-electrolytes |
| 6. Carboxyl | 16. Equilibrium | 26. Oxidation |
| 7. Catalysts | 17. Fire damp | 27. Radical |
| 8. Cations | 18. Formula | 28. Reduction |
| 9. Choke damp | 19. Hydrolysis | 29. Symbol |
| 10. Dialysis | 20. Ions | 30. Zymase |
- a.* Positively charged particles of electrolytes in solution.....()
- b.* A double decomposition reaction with water as one reactant()
- c.* A characteristic of substances which possess both acid and basic properties.....()
- d.* Elements which appear to be identical in chemical properties but differ in atomic weights and in properties depending upon atomic weights.....()

C. A test of knowledge of chemical symbols, formulas, and valence

Directions.—Below are symbols for some chemical elements. On the blank line after each symbol, write the name of the element which the symbol represents, as in the sample.

Sample. H.....*Hydrogen*

Directions.—Below are the formulas for certain chemical compounds. On the blank line after each formula, write the chemical name of the compound which the formula represents, as in the sample.

Sample. CO₂.....*Carbon dioxide*

Directions.—Below are the names of some chemical compounds. After each name, an element or radical, which is one of the constitu-

ents of the compound, is indicated. On the blank line which follows it, write the valence which the element or radical shows in this compound. In each case indicate whether the valence is positive or negative.

Sample. Sodium bromide; the valence of Br is..... I, —

D. Testing the ability for balancing chemical equations

Directions.—Below and in the following columns are some unbalanced chemical equations. In place of the numbers necessary to balance the equations, small letters have been substituted. You are to balance the equation by placing in the parentheses before the letter at the right, the proper number which should be used in place of the letter. The sample shows what you are to do:

Sample. $a\text{H}_2 + b\text{O}_2 \rightarrow c\text{H}_2\text{O}$ (2) a
 (1) b
 (2) c

Note that to balance the equation the figure 2 is needed in place of a , the figure 1 in place of b , and the figure 2 in place of c .

E. *A test involving the recall of information and its use in solving a problem*
This objective is commonly called the application of facts and principles.

Directions.—In each of the following exercises a problem is given. Below each problem are two lists of statements. The first list contains statements which can be used to answer the problem. Place a plus sign (+) in the parentheses after the statement or statements which *answer the problem*. The second list contains statements which can be used to explain the right answers. Place a plus sign (+) in the parentheses after the statement or statements which *give the reasons for the right answers*. Some of the other statements are true but do not explain the right answers; do not check these. In doing these exercises then, you are to place a plus sign (+) in the parentheses after the statements which *answer the problem* and which *give the reasons for the right answers*.

A water solution of hydrogen chloride is placed in a glass vessel containing two separated electrodes connected with the opposite poles of a storage battery. What will probably happen at each electrode, and why?

- a. Hydrogen gas will bubble off the negative electrode. ()
- b. Hydrogen gas will bubble off the positive electrode. ()
- c. Chlorine gas will bubble off the negative electrode. ()
- d. Chlorine gas will bubble off the positive electrode. ()

Check the following statements which give the reasons for the answer or answers you just checked.

- e. The chlorine ion picks up an electron at the electrode. . . . ()
- f. Hydrogen chloride is separated into hydrogen ions and chlorine ions in water solution. ()
- g. Chlorine ions are negatively charged. ()
- h. The hydrogen ion picks up an electron at the electrode and forms the hydrogen atom. ()
- i. Ions have totally different properties from uncharged atoms ()
- j. Like charges of electricity attract each other. ()
- k. Chlorine ions are positively charged. ()
- l. The hydrogen ion gives up an electron at the electrode. . . ()
- m. Many compounds may be decomposed by the removal or addition of electricity to their ions. ()
- n. Hydrogen ions are positively charged. ()
- o. Hydrogen ions are negatively charged. ()
- p. Opposite charges of electricity repel each other. ()
- q. The chlorine ion gives up an electron at the electrode and forms the chlorine atom. ()
- r. Opposite charges of electricity attract each other. ()

INDIVIDUAL DIFFERENCES

Variability. When we take stock of our friends and neighbors, we find them strikingly alike in many respects, but at the same time markedly different from one another. Even though they belong to the same race, same nation, same religion, or same family, they differ individually in many respects from other members of their group. The strange people of distant lands appear much more alike to us than our neighbors, but if we were to live in their midst, we should soon find that, like our neighbors, they too neither look nor act alike.

Biologists tell us that variability is an asset, for if all organisms of the same genus or species were alike, there would be little, if any, progress. The living organism that is different is the one which

offers opportunities for change; but nature or society must control the process if only changes for the better are to be perpetuated. Variability, then, is an asset in the realm of nature, and when properly utilized becomes an asset to society.

Two illustrations will make our point clear. (1) A rust disease attacked thousands of acres of wheat. Close inspection showed that a single plant remained free from the rust. Seeds from it were carefully garnered and planted the next season. These stocks grew up into healthy plants, whereas plants raised from other seed were afflicted with the rust disease. The parent stock that resisted the disease was *different*. A mutation made wheat-growing possible in spite of this disease. Here variability meant progress.

(2) Individuals and societies differ. In the eighteenth century, a relatively new form of government, the republican, was developed on this continent. It was different from contemporary systems and severely criticized by them. Yet this new start paved the way for other nations to follow, if and when the variant proved to have features that seemed to work. Our American government was a distinct contribution of the times in which it was founded. This variant was a political and social asset.

In nature, variants that are weaklings tend to die, unable to survive the rigors of their environment. In the modern world, science is enlisted to combat this tendency, and weaklings, particularly members of the human family, are often saved. Medicine and scientific care have saved thousands who otherwise would have been doomed either to an early death or to mental and physical impairment. The famous Dionne quintuplets were born prematurely and to parents having little of worldly goods; but through the best of medical care, nursing, and training, they have developed into normal healthy children.

How people differ. Individuals differ in all manner of traits, abilities, and interests. They differ in physical features and in their social, moral, intellectual, emotional, and aesthetic natures. Some learn easily, others slowly. Some have a talent for art or music; others seem to be considerably lacking in these aptitudes. Some are quick and assured, others hesitant. Some like to deal with

people, others with materials and machines. Some are inventors and creators; others are said "never to have entertained a new thought in a lifetime." Some have this interest, others that; and so on to man's infinite number of tastes, for which there is no accounting.

It is these differences in abilities, aptitudes, and interests that make possible different kinds of occupations. There would be no progress if everyone wanted to do the same thing. It is true that intelligent people are able to adjust themselves easily. It is also true that intelligent individuals can acquire almost any interest. People select or are selected for their life work more or less according to their abilities and interests. There are a few exceptions, but not many compared with the number for whom this statement is true.

Causes of variations in man. Why do people differ? The causes are many rather than few; moreover, factors do not operate singly, but as an amalgamation. The latter fact should be kept in mind while we discuss some of the most potent causes of differences.

1. *Biological heredity* is a factor none of us can escape. It plays an important rôle in man-making, but always acts in conjunction with an environment—never alone. The form and function of the body are determined by heredity operating in an environment. Full-blooded Negro parents have children who are black. Full-blooded whites have children of their own color.

Biological heredity is expressed through racial and family inheritance. If children resemble parents, it is because of biological heredity. Identical twins are alike because they developed from the same ovum. Though environment accounts for many of the complex characteristics of the child's behavior with which the school is primarily concerned, hereditary factors are nevertheless very important, as, for example, in the case of intelligence, musical talent, and temperament.

2. *Physical environment* is a factor that operates strongly with the other factors in making people what they are. The unborn child grows in a physical environment which provides the proper temperature and sustenance. If this environment is seriously dis-

turbed, the offspring is likely to be weak or defective in some way. As everyone knows, physical environment is about us every hour of the day and every day of our lives. We are continually being influenced by temperature, humidity, circulation of air, food, disease, and accidents; by art, music, and literature. Our parents, brothers and sisters, teachers, and neighbors are a part of our physical environment and add their influence to the great number operating upon us.

3. *Our social heritage.* This aspect of our environment consists of the contributions of civilization with which we are brought into contact. Our language, customs, number system, religion, political and social patterns, literature, and products of scientific ingenuity are part of a culture that has been accumulating for centuries, but with which the individual may become familiar in part in a few years. If it were not for this culture, man would be little better than the animals.

4. *Every learning* changes the individual in some way. People differ because their habits, attitudes, and interests are unlike. They differ because of their ideals, sentiments, ambitions, emotional control, or other learnings resulting from their experience. In other words, some people are what they are because they are illiterate or ignorant; others, because they are learned, informed, educated.

5. *Physical condition.* Volumes could be written on the ways in which this factor influences the individual's behavior—attitudes, learning, adjustments, and satisfactions—and on how it produces variations. Mindful of the importance of this factor in man's resultant behavior, the next time we find someone pessimistic or grouchy, we may be less critical of his reactions. Perhaps he is suffering from a sluggish liver, lack of energy reserves, indigestion, glandular disturbances, or mental conditions induced by his physical condition. If he is lacking in energy and vitality, the probability is that some part of his organic system is not functioning properly. If learning comes very slowly, if at all, perhaps some condition in the brain or some glandular disturbance may be the cause.

The quality of the brain determines brightness or the ability to learn. The idiot has a brain that is very poor in texture. The intelligent individual possesses a brain with infinitely more complex neural interconnections. The insane, the psychopathic, and the epileptic probably suffer from some kind of organic disturbance. Even the hallucinations of the alcoholic occur because alcohol attacks the higher nerve centers.

Study and work are affected by such common things as worry, fear, failure, and feeling of inferiority. By upsetting the organic processes, such mental conditions affect the smooth running of the body machinery, and this derangement in turn augments the condition.

Physical condition determines more or less the extent to which the individual can concentrate on his tasks. If he is suffering from aches, pains, or fears, concentration on his work is well-nigh impossible. As every teacher and employer knows, the quantity and quality of work are greatly influenced by this factor.

Furthermore, this factor does more than affect the individual, for through him it reaches out and influences others. A sick poet writes a poem reflecting his thoughts. Others read the poem and may be swayed by its sentiment. A factory boss suffering from this or that disorder or disease is likely to be grouchy and fault-finding in his dealings with his family and employees. His ill-temper may go so far as to disturb the equanimity of his home. If he makes the lives of his employees unhappy, they in turn may be unreasonable in their home relationships. An employee repressed in his work may lord it over his family with unhappy or disastrous results.

In numerous other ways, physical condition affects our world. It gives rise, directly or indirectly, to all sorts of problems, and to many efforts at solution. Hospitals, insurance companies, and governmental health departments are involved. A medical profession and numerous other professions have been established to minister to the welfare of man.

Cripples and individuals of ugly or unattractive appearance often feel their condition so keenly that, where proper guidance is lacking, their mental outlook and their very characters may be-

come distorted. Yet there is a way out, if these and thousands of others so afflicted only realized it.

In 1935, in a very unusual accident, a boy living in a small New Jersey town lost both hands. In despair he wondered how he was to compete with others in life; how he could take care of his most intimate needs and requirements. A benevolent and fraternal organization secured for him artificial limbs that are about 80 per cent efficient for most demands of life. With this start, hope began to dawn. Friends asked for expert counsel in his behalf. The boy was shown that many great men and women in history had been handicapped in one way or another, and that by sheer persistence, and faith that never faltered, they surmounted their difficulties. In some instances, of which this case may be one, handicapped individuals have risen to levels that would perhaps never have been attained had the individual no handicaps. An individual may surmount all sorts of disabilities *if he has determination and persistence*, a goal, and insight to realize it. Handicaps, be they physical, economic, or social, need not stand in the way of success if some dominant purpose prevails.

The consequences of variability are many. One of those mentioned above was that certain variations led to progress. Variations get us out of the beaten path, whether it be in the field of personal adjustments, in biology, economics, or government. They inevitably lead to new attitudes, new procedures and developments. They make life more interesting and our institutions more complex. There are abilities and interests for all kinds of work, and all kinds of work for individuals of different tastes and aptitudes. Variations in personalities are so great that no normal person need have trouble in finding friends, business partners, or life partners.

At the lower end of our scale of values, however, we find extreme cases, individuals who are unfit for life in society because of their high degree of subnormality or of abnormality. They must be humanely and systematically cared for, usually in institutions. Buildings must be erected, nursing and medical care provided, laws enacted governing admission and maintenance of patients, and funds for maintenance provided by taxation. The presence of

these variants, or atypicals, brings about many changes in our social views and practices and, directly or indirectly, in the life and thought of all.

Our attitude toward others. Each one differs from everyone else. Our attitude is that certain variants are an asset to humanity, and that others in our midst, although not assets, may become useful and happy citizens if we have the insight to discover by what means this end may be accomplished. As science progresses, many of these undesirable variants may be salvaged. Formerly, certain head injuries incident to birth produced a large proportion of mental defectives. Today, many such cases are salvaged because more enlightened and skilled physicians withdraw the blood from the area between the brain and skull and thus prevent clots from injuring delicate brain tissue.

In recognition of the differences in individuals, the modern school is being adapted to the individual needs and potentialities of all pupils. Subjects are now regarded as existing for the student. In some schools, the curriculum is adapted; in others, the amount of time needed by individual learners is the variable. In some instances, pupils are grouped according to their subject abilities, interests, or degree of maturity. All kinds of adjustments are, in fact, being made, with the result that pupils are happier and learn better.

SOCIAL ADJUSTMENT

If we know the psychology of the growing child and the adolescent, their ways of behaving, and what situations will produce the behaviors desired, we can better choose and use our educational means and materials. The child must be considered as a whole person, and as an interacting part of a larger whole (society) which establishes its goals, releases its drives, and changes its life. The child naturally responds to certain situations because it is the nature of living organisms, through urges and their satisfaction, to seek or maintain equilibrium. Apparently fundamental to human nature are the following urges: curiosity, creativeness, gregariousness, hunger, thirst, self-enhancement, acquisitiveness, sleep, fear, anger, and love.

In the final analysis, the child is constantly adjusting himself to the world about him. Some of the adjustments are facilitated or made possible by inner processes of maturing; others, by learning. When the child faces certain situations, he adjusts himself in some new way. His acts may represent for him some new thought, new inference, new conclusion, or new behavior toward some object or idea. Perhaps the most potent means of child development is the proper utilization of the child's creative urges, interests, purposes, curiosities, and social tendencies.

Children are children, not miniature adults. Their responses differ from those of adults because they have had only limited experience and are immature in both physiological and mental development. The schools must educate the child that is.

Mental hygiene. The goal of the educator's efforts is well-developed, well-adjusted, and happy learners. Psychologists have studied the human personality, and their findings in this area are most helpful to teachers. They tell us what physical and social situations best develop "a wholesome personality," thereby giving us information which both parent and teacher can use in setting up the kind of environment, providing the food, schooling, and recreation needed toward this end. Every experience, thought, and deed of the child is likewise part and parcel of this all-inclusive and important process of developing the personality. Maladjustments often grow out of conditions and circumstances which, for the most part, could have been prevented. Most maladjustments are learned, especially when superimposed on a weakened constitution. By knowing which things predispose the individual to personality difficulties, and which things promote his wholesome growth, the parent and teacher can steer a truer course for realizing wholesome personality.

Prevention is the keynote in mental hygiene, but there are always cases that must be treated. Many of these call for the services of the trained psychiatrist.

Character and social functioning. Character, or social functioning, is one of the most important goals of education. To the attainment of this objective, psychology has made a real contribution. Char-

acter denotes both an inner want and an outer expression. Emphasis is now on the outer expression, or conduct, and the ways of developing the conduct desired.

Character is no longer conceived as fixed or static, but rather as a changing dynamic process that is best developed through social thinking and creative experience. It is the "art of living." It is not best conceived as the sum total of habits or traits, for its expression involves the self functioning as a whole. Every experience enters into character.

From experience and psychological studies, it has been found that character best develops in group situations wherein the individuals participate in the activities. They discuss, deliberate, judge, act, and review the results of their actions. Such groups may make mistakes; but if they see their mistakes and proceed to rectify them, there is perhaps more character growth than there would have been if the teacher or parent had guarded against all mistakes. Obviously, wise guidance on the part of the parent or teacher would make the commission of major mistakes unlikely.

Reflective thinking. Reasoning or reflective thinking is becoming more and more important in modern life. Almost every situation calls for it. Reflective thinking is indispensable to good character and efficient citizenship. It is reasoning that gives power to meet the numerous situations of life in a superior way.

Educators have learned how to promote pupil growth through reasoning. Children learn to reason by reasoning. They must learn the importance of having enough facts, or data that represent a good sampling. They must learn to cull out the valid and relevant data from all other, and how to organize, classify, and analyze their data so that they point to some conclusion or generalization. They must learn how to test or verify the conclusion. In all these essential steps of the reasoning process, the student must sense the importance of open-mindedness; and from his education for reflective thinking he must learn that there is no one way or single technique. Reflective thinking calls for varied adjustments and not for a fixed mode or pattern of response.

Educators are organizing their curricular materials and building

their activity programs around projects or activity units since these seem most effective for developing *pupil purposing, pupil planning, pupil executing, and pupil judging*. Examinations are prepared which call for power to relate, power to infer, and power to generalize. In these and still other ways, our schools are educating children to think reflectively.

Creative thinking. Psychologists tell us that creative urges are a part of the child's equipment, and that these can be utilized in promoting growth. Educators are using these suggestions perhaps more today than ever before. Children are writing poems and stories, painting pictures, and building boats and model airplanes, devising and painting stage scenery, and inventing new games. The major rôle of the teacher is that of stimulating the moods of pupils and allowing them to carry out their own purposes. Here and there the teacher will tactfully give direction, but there is no pattern to be followed. Freedom characterizes the activity. Each pupil can create something. For each there is resultant satisfaction. Ingenuity, resourcefulness, and insight are at a premium. There is growth of a most important kind and a growing ability for better productions.

EDUCATIONAL PRACTICE

Psychology applied to method. There are those who condemn all consideration of method in teaching. They assert that knowing one's subject is tantamount to knowing how to teach it well. But closer observation and numerous psychological studies reveal a very different set of facts.

The only way any student can learn is by using a method. The only way a teacher can teach is by using a method. The curriculum can influence the child only when there is a method. Here again, experience and psychology show that some methods are superior to others in securing any given outcome. If verbatim memorization is desired, some methods are more economical and hygienic than others. If understanding is the goal, again certain methods stand out as superior. If ethical conduct or good citizenship is the objective, certain other methods of acquisition are found to be

most effective. Also, a teacher may use one procedure very effectively while his colleague is more successful with another method. Psychological techniques aid the educator in ascertaining the value of different methods.

From all these studies and observations, three basic principles of method emerge. Other things equal, (1) problem-solving procedures should be used; (2) socializing procedures should be used; (3) the curriculum and procedures should be adapted to the appropriate individual needs and requirements.

The teacher's personality. Numerous studies stress the importance of the teacher's personality. The teacher who understands children, who likes them, and knows how to direct their activities is a constant source of inspiration to all and a helpful guide and friend. In recognition of the prime importance of personality, schools are turning more and more to superior teachers who in turn make it their chief business to develop wholesome personality in children.

Some educational malpractices. From experience and from the evaluation of learning outcomes, we can now summarize by indicating some educational practices that are violations of sound principles of psychology. Of numerous instances the following stand out.

1. *Putting too much pressure on pupils.* The superintendent puts the pressure on his principals; the principals put pressure on their teachers; and they, in turn, put pressure on the pupils. The result is that thousands of children are being forced to study masses of factual material that soon will be forgotten, when they might better be sleeping, playing, or engaging in hobby activities. An excessive amount of home work, at all elementary and high school levels, is doomed. Excessive pressure has been demonstrated again and again to be undesirable from the point of view of mental hygiene.

2. *Putting too much emphasis on learning factual material* that is not long retained. A knowledge of facts may be required, but not for their own sake. If they help the individual to make useful adjustments, contribute to his growth and social functioning, they are indispensable. Malpractice consists in "cramming the mind"

with information, and in expecting the mind to soak up the facts as if it were a sponge—as if the objective were to make the individual a kind of walking encyclopedia. The efficient mind is a power mind, not an encyclopedic mind. A person should know where to find information when he needs it, how to search for it, and how to use it.

3. "*Hothousing*" or forcing children when too young to learn formal subjects. At later ages all the way up to maturity, they can learn these subjects more effectively and happily.

4. *Requiring certain subjects on the supposition that they are indispensable in the development of cultured persons or good citizens.* We know from psychological studies that instruction in Latin, algebra, geometry, Greek, and French in itself has no greater potency than instruction in many other subjects for developing intelligence, a liberal mind, and cultural understanding. The teacher's personality and teaching techniques and the pupil's purposes and interests are paramount; the subject is of secondary importance. One teacher can make Latin a "live" subject, and give the pupils a real appreciation of cultural values, while for another teacher it is "dead"—a meaningless and futile exercise. The same is true of all other subjects and activities. A good teacher can develop interests in any normal pupil in almost any subject. On the whole, subjects that are most nearly related to the life of today, and which help most in making adequate and wholesome adjustments, are better for the masses than subjects having fewer or more remote relationships.

5. *Teaching too many facts* in one class session. This violates the psychological principle that "the amount and degree of attention depends upon the absence of counter attractions." A few facts well buttressed with supporting data and so organized that they point to some generalization can be mastered, but when scores of facts are literally thrown at the student, few, if any, take root.

6. *Failing students* on account of poor work. Underlying every failure, theoretically, is some cause or set of causes. The student may be lacking in intelligence, or so made that he cannot move forward at the pace set for the class. He may be suffering from ill

health, glandular disturbances, excessive growth at the moment, disturbing home influences, or from numerous other conditions that might be affecting him. The modern school recognizes that individual differences do exist, and the school organization, curriculum, and method are adapted to pupil needs. The school system that fails its pupils is indicting its own organization, curriculum, method, and attitude. So most failures constitute a psychological blunder.

7. *Bestowing marks and honors* as is done in many schools. Some modern schools that have dispensed with marks find that their students do not suffer from loss of motivation. Their achievements, interests, and growing purposes, incident to learning, furnish the dynamic. Marks were originally intended as means to an end, but for most students they soon became an end in themselves.

Honors are customarily bestowed on outstanding students, because of their superior academic feats or for other reasons. Why should we recognize the outstanding student when we know the limitations of marks? Why should we bestow any special honor on the student lucky enough to possess a fine brain, or fortunate enough to have social and economic conditions favorable to his use of it? How are the other pupils in the class affected when some one or two members are singled out? How do honors affect the recipients? The bestowing of special honors and the giving of prizes violate principles of sound psychology.

8. *Emphasizing imposed knowledge.* Parents and teachers are generally prone to emphasize facts and points of view which they entertain, rather than to emphasize educating the pupil to think reflectively for himself. Reasoning, one of our highest forms of behavior, should always be encouraged. Too often our teachers and schools discourage thinking, or attempt to coerce pupils to think as they think, which is not thinking at all for the pupil.

9. *Thwarting creative urges.* This is constantly done in home and at school; yet these very urges are potentially rich in possibilities for growth, personality development, and good citizenship.

10. *Neglect of opportunities for character formation.* Opportunities always present are not intelligently used for the purpose of forming

character or educating students for social functioning. The teacher and parent too often think of the subject, not the behaviors desired. Attention is too often centered on marks rather than on how the learning under consideration will help the student to do the best thing in each situation that arises.

A FINAL WORD

It would not be surprising if the student of psychology were to observe that the applications of psychology to education cover about the same ground as the entire text. This is true to a marked extent. All human psychology purports to help students make adequate and useful adjustments. The teacher must know how these are accomplished if he would guide others in making them. In brief, the teaching of general psychology and the learning of it involve the very principles discussed briefly in this chapter.

QUESTIONS

1. How may a knowledge of educational psychology increase the efficiency of the teacher? Our best teachers make use of sound principles of psychology in their teaching even if they have never studied the subject. How might a study of educational psychology have helped them?
2. Prepare in collaboration with two or three other members of the class a report on the applications of psychology to each of the following: (a) classroom discipline; (b) teaching technique; (c) a functional school organization; (d) an effective character education program; (e) learning to study.
3. What fundamental assumptions underlie the use of tests and examinations? Do these assumptions hold for tests in the field of general psychology?
4. Show that the teacher of your general psychology course must of necessity be an educational psychologist.
5. What is meant by each of the following statements:
 - (a) "A thing is learned when it is made over into one's experience."
 - (b) Goal-seeking, purpose, and motive are integrating factors in learning.
 - (c) Education is inherent in the social process.
6. Discuss the psychology of marks.

7. Describe in detail an experimental technique that you would use in measuring resourcefulness in learning some skill.
8. Upon what factors does learning efficiency depend? Does your answer hold true when it comes to learning general psychology?
9. Apply what you have learned about the transfer of training to the learning of general psychology. Report any difference it makes in your study methods and learning outcomes.
10. A student may be weak in emotional control. How may a normal degree of control be developed in accordance with sound principles of psychology?
11. In many colleges students are required to take at least two years in some classical or modern foreign language, one or two years of college mathematics, and the like. What assumptions underlie these requirements? In the light of your knowledge of psychology, are these assumptions well founded? Why or why not?
12. What difference does your knowledge of psychology make in regard to the way you study your psychology lessons and the way you prepare for examinations?
13. How may a student's dislike of general psychology be overcome?
14. Apply your psychology to learning to appreciate some work of art, poem, or music composition.
15. Should college, business, and industry adapt their procedures and activities to the appropriate needs of all of the personnel? Why or why not?
16. What psychological reasons can you give for student failures? Apply your psychology to the situation and tell what specific changes you would make in your educational set-up that would improve conditions.
17. How may the principles of educational psychology be applied in learning law, medicine, agriculture, and engineering?
18. Consult such volumes as *Leaders in Education*, *Who's Who in America*, textbooks in history of education, encyclopedias, and textbooks written by the following and report to the class on the contributions each made to educational psychology:

John Dewey	Hugh Hartshorne	Percival M. Symonds
Frank N. Freeman	William James	Lewis M. Terman
Arnold Gesell	Charles H. Judd	Edward Lee Thorndike
G. Stanley Hall	Mark May	J. E. W. Wallin
19. How has the study of general psychology contributed to your growth?

How may the growth obtained be evaluated?

20. In what ways has this list of questions illustrated the applications of psychology to education?

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APPENDIX

SUPPLEMENTARY BOOK LIST

Students desiring to do supplementary reading in the field of psychology will find the following book list suggestive. An asterisk before a book title indicates that the book is of an advanced character. A circle before a title means that the volume is written in a semi-popular style.

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